

Service Manual

Manuel de service

Ranger RX series

Ranger RX, Ranger RX Speed & Ranger RX Speed AS



Schematic diagrams and part list

Schémas et liste des pièces

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Safety notice

IMPORTANT !

The interior of the generator or compact contain components carrying dangerous levels of electric charge, even though the unit has been disconnected from the mains or battery supply.

ALWAYS TAKE THE FOLLOWING PRECAUTIONS:

1. Always disconnect it from mains supply or battery supply, and discharge the unit before (for generator) and after (for compact) removing the outer cover or housing. This is best achieved with a suitable discharge resistor (code 11931 for 220V, 11930 for 110V) and adapter cable (code 11095) fitted to a lamp head plug which may be inserted into a lamp head outlet for generator only. For compact connect the discharge resistor in the flash tube terminals.
2. Take care when opening a generator. Always start by connecting a voltmeter across the storage capacitors, as capacitor drainage may not have occurred.

ACHTUNG GEFAHR !

Auch wenn die Netzspannungsversorgung oder die Batterie Box nicht im Generator steckt, können im Innern des Gerätes noch gefährliche elektrische Spannungen vorhanden sein.

ACHTUNG GEFAEHRliche HOCHSPANNUNG:

1. Bevor Sie ein Blitzgerät öffnen, entfernen Sie den Netzstecker und die Batterie Box und entladen Sie zuerst die Kondensatoren mittels Entladewiderstand (Best.Nr. 11931) und Adapter Kabel für Ranger / Free Style (Best. Nr. 11095).
2. Vorsicht beim Öffnen eines Blitzgerätes. Verbinden Sie sofort ein Voltmeter mit den Kondensatoren, denn diese könnten nicht entladen sein.

ATTENTION DANGER!

Des tensions électriques dangereuses restent présentes dans les condensateurs, même lorsque l'appareil est déconnecté de son mode d'alimentation (secteur 120/230V ou batterie dans le cas des générateurs autonomes « Free Style et Ranger »).

PRUDENCE! LORS DE L'OUVERTURE D'UN GÉNÉRATEUR OU COMPACT.

Pour un flash fonctionnant sur le secteur, la première action sera de retirer la fiche d'alimentation.

Avant d'ouvrir un générateur déchargez-le avec un dispositif approprié, (n° de code 11931, version avec une lampe 230V) ou (n° de code 11930 version avec une lampe 120V).

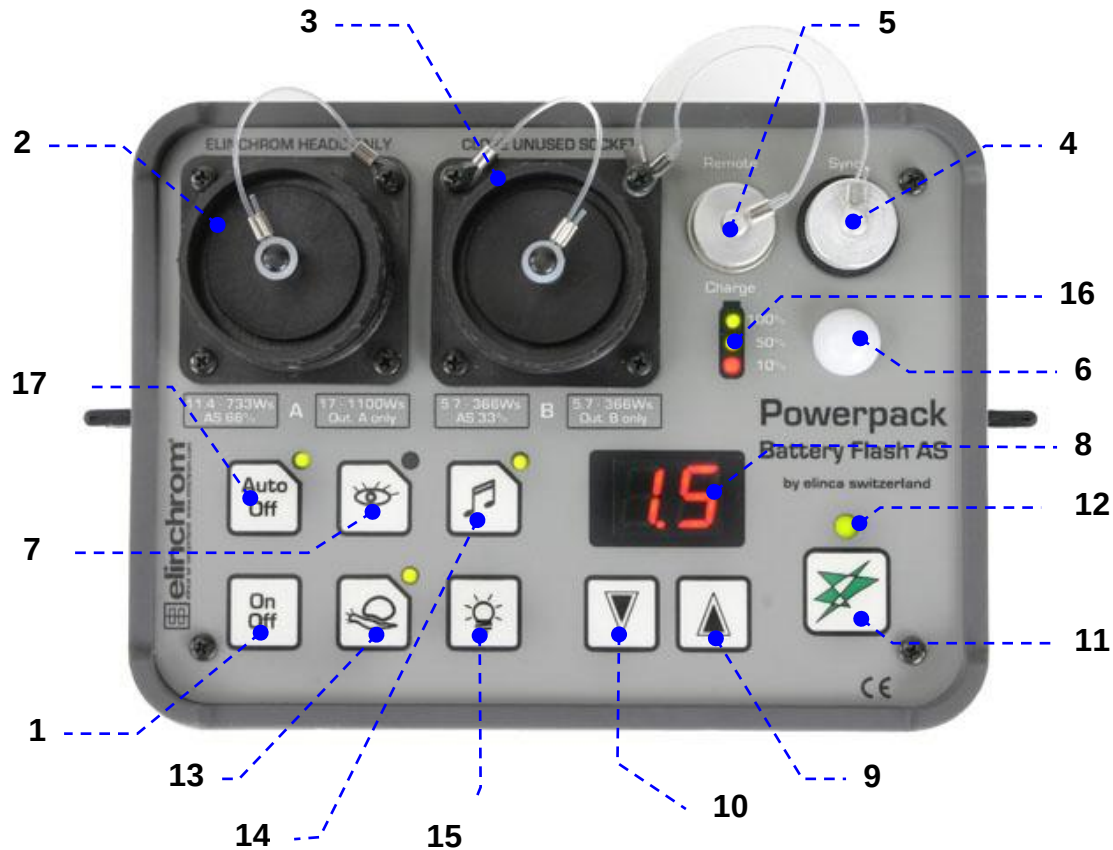
Pour un compact « Style », il faut retirer une partie du boîtier plastique (1/2 coque droite) et ensuite déchargez-le en raccordant le dispositif 11931 (ou une résistance de puissance appropriée) sur les tiges ou les éléments de fixation du tube flash.

Pour un flash fonctionnant sur batterie « Free Style et Ranger »

Avant de l'ouvrir, éjecter la batterie de l'appareil et décharger l'unité en utilisant l'adaptateur 11095 et le dispositif de décharge 11931 ou (11930 version 120V).

Avant toute intervention, vérifier avec un voltmètre la tension aux bornes des condensateurs. La décharge peut ne pas avoir eu lieu, la rupture d'un élément de sécurité ou d'un conducteur peut en être la cause.

Front panel



Operating instructions

1. Check that the battery box is locked correctly.
2. Switch unit power (1) OFF (Power display lights off)
3. Connect ELINCHROM lamp heads and lock connectors.
4. Connect Synchro cable to sockets (4)
5. Switch unit on (1)
6. Select Flash power (8 or 9)
7. Check and change configuration buttons, Slave (7), Slow charge mode (13), Audio (14) and Auto Off (17)
8. The green Light in open flash button (12) will light up, indication that the unit is ready for operation.

According to the safety regulation: We draw your attention to the fact that this equipment should be used only in a dry environment; it must be protected from dripping water and from extremely dusty conditions.

INDEX

1. On/Off switch
2. Outlet A (Elinchrom Equipment only)
3. Outlet B (Elinchrom Equipment only)
4. Synchro-socket Amphenol
5. Charge socket
6. Photocell receptor
7. Slave cell switch on/off with LED indicator
8. Digital power display and charge/discharge indicator
9. + Power adjustment in 1/10 f-stops, with ADF
10. - Power adjustment in 1/10 f-stops, with ADF
11. Open-flash
12. Ready indicator
13. Slow charge mode with indicator
14. Acoustic recharging signal (Beep) with indicator
15. Modelling lamp switch (on/off free or prop)
16. Battery Indicator (green: 100%, 50% and red: 10%)
17. Automatic OFF Timer (5 minutes) on/off with indicator

Trouble Seeking Guide for Free Style / Ranger

Important Note

ALWAYS DISCHARGE UNIT BEFORE COMMENCING WORK !
(d  chargez l  appareil avant de commencer la travail)

Use **ELINCHROM EXCHANGE SERVICE** for all **ELINCHROM** professional flash unit boards, assembled with **SMD -Components**

Known problems

Here is a small list of modifications or solutions with Ranger RX troubles.

1. A full recharged battery does not work more than 50 flashes at full power

The battery is older than 3 years, the batteries capacity gets worse and worse. Handle the battery always with care and recharge the battery every 6 weeks to get the maximum battery life and capacity out of it.

The battery life is up of the use, the temperature, the recharge interval and others conditions. The maximum life of a new battery is approx. 5 years and max. 500 to 2000 recharge cycles.

➔ **Replace the battery!**

2. A full recharged battery does not work and the unit switched in Error mode 'Er', or the unit switched off itself

➔ See under Known Problems 1.

This error messages are shown by the unit display if an error is detected by the units Micro-Controller.

Error Message Display Value	Description	Possible faults	Note
E.r	Unit switched OFF automatically after Error display and acoustic sound	Over temperature	1
E.r	Unit shows Error display and acoustic sound, but does not switch OFF	Over voltage	2
E.r	Unit directly switched OFF without (or very short) Error display and acoustic sound	Defect Battery	3

Note 1: The unit is temperature controlled. When the internal temperature is higher than 80° C the unit switched automatic in error mode "E.r" and an acoustic signal (if BEEP is switched on) is generated If the internal temperature is lower than 60° C the unit will start working again.

Note 2: The capacitor charging of the flash capacitors is controlled and will switch into an error mode if over voltage is detected. The unit disables all power functions and shows Error display (E.r) and an acoustic sound (3x beeps).

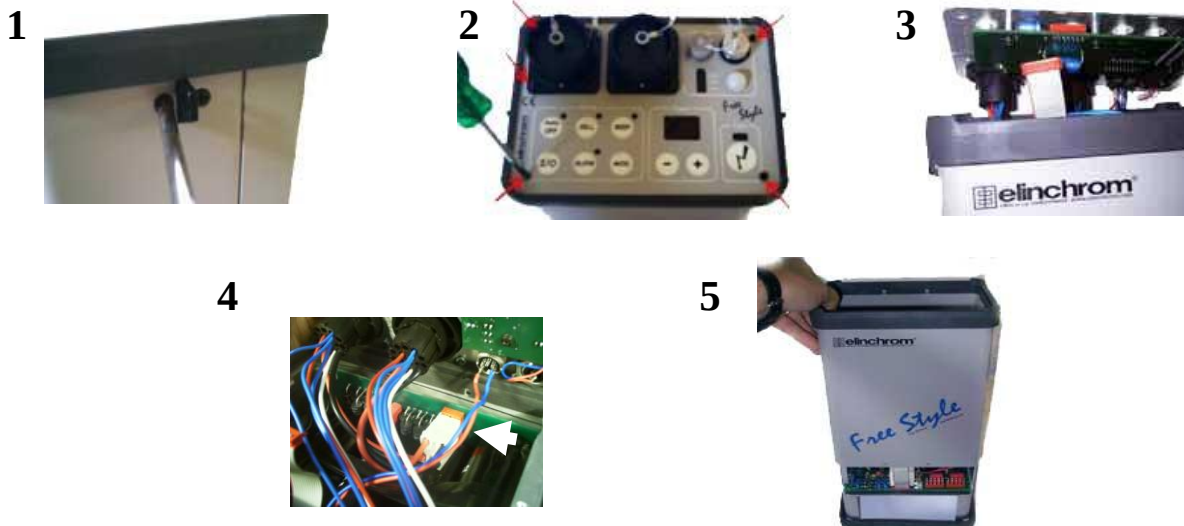
Note 3: If the unit is switched ON and switched OFF automatically after some seconds without showing an Error or an Error acoustic sound, check and recharge the battery. If the problem is not solved after recharging try another the battery box or replace the battery.

Repairing Help

1. Open Free Style / Ranger / Ranger RX series units

ATTENTION:

Before you start remove battery box and always discharge flash capacitors (check SAFTY NOTICE)



1. Open strap holder screws left and right housing side (2x on each side)
2. Open front panel screws (5x)
3. Disconnect front panel flat cable and lift module
4. Disconnect Outlet cables from flash and power board and remove front panel module
5. Lift Free Style housing

2. Fault tracing for blown battery fuse

- Wrong value fuse => Ranger RX: 30A (green); Ranger RX Speed (AS): 40A (orange)
- Power board is part of « **exchange service** »

3. Broken power transistors T405-T407, T410

- Exchange all power transistors !
- Exchange also U400 !
- Check maximum flash voltage at maximum Power setting (=680VDC)
- **Current Adjustment not necessary by service!**

4. Adjust maximum charge current

- **Current Adjustment not necessary by service!**
- Do not change the position of the potentiometer P400, locked by glue!
- The maximum charge current out of the 7Ah battery is approx. 28 Amps (Ranger RX) and out of a 12Ah battery is approx. 80 Amps (Ranger RX Speed (AS))

5. To trace for a faulty photo flash capacitor

Check the following with power setting to minimum.

Use two voltmeters, one for group A and one for the group B of the flash capacitors

- A. Place the common probe on the neutral point of test on the PB3, or on the neutral point on the PB4 and the other probe on the ½ voltage test point.
- B. Place the other Voltmeter on the positive test point on the PB3, and the other probe on the test point ½ voltage (common test point)

Briefly switch the unit "ON" and observe both Voltmeter readings. One side of the charge capacitors will rise, the other will not. This test will determine on which side the faulty component can be found.

6. Replacing a Photo flash capacitor

- Always discharge the unit before commencing work!
- Check that there is no voltage across the new capacitors!

WHEN A PHOTO FLASH CAPACITOR IS BEING REPLACED. IT MUST BE FORMATED

6.1 Formation flash capacitors

- Connect two voltmeters for each capacitor group (see point 2. above)
- Set the unit to minimum power
- Flash five times and check capacitor group voltage
- Increase power 1 f-stop higher, flash 5 times and wait 5 minutes
- Increase power 1 f-stop more, flash 5 times again and wait 5 minutes
- Compare flash voltage between group A and B if the difference is smaller than 10V
- If the voltage difference is higher repeat formation.



clockwise

6.2 Adjust flash voltage

- Connect two voltmeters for each capacitor group (see point 2. above)
- Set power to minimum
- Turn P401 clockwise to maximum (Over voltage protection)
- Turn P402 counter clockwise to minimum (HTD)
- Set power to maximum
- Adjust P402 clockwise to maximum flash voltage HTD=690V (HTD=voltmeter values A+B)
- The maximum flash voltage of each capacitor group must be smaller than 360V! If it is higher repeat step 3.1.



counter
clockwise

6.3 Adjust Over voltage protection

- Connect two voltmeters for each capacitor group (see point 2. above)
- Set power to minimum
- Turn P401 clockwise to maximum
- Set power to maximum (only if flash voltage is adjusted before => see step 3.2 above)
- Check if capacitor group voltage A or B is lower than 360V (if not, flash voltage is not adjusted or capacitors are not reformed => see step 3.1)
- Adjust capacitor group voltage A+ B = HTD to maximum 720V with P402 (HTD = 2x360V=720V)
- Adjust P401 counter clockwise until "Er" is shown in the unit display => ERROR MODE = Over voltage detection
- Switch unit off
- Turn P402 counter clockwise to minimum
- Switch unit on and adjust P402 to a maximum flash voltage HTD=690V (HTD=voltmeter values A+B)

7. Modelling lamp circuitry does not function

- Modelling lamp fuse blown (quick acting) → check fuse on Head and on Free Style / Ranger inside Battery drawer

8. Fault tracing for firing faults

- Check connected Head (cracked flashtube)
- Power board: Trigger voltage at capacitors C405 and C406 (0.22µF/400V)
- Flash board: check Trigger Booster diodes D402 and D408 (short circuit)
- Check READY LED (if off triggering flash tube is not possible)
- Check Transistor T408 and TR401

9. Display shows only “Point” and cannot switched off, only with removing the battery box

- Exchange key board!

Special circuitry and Graphs

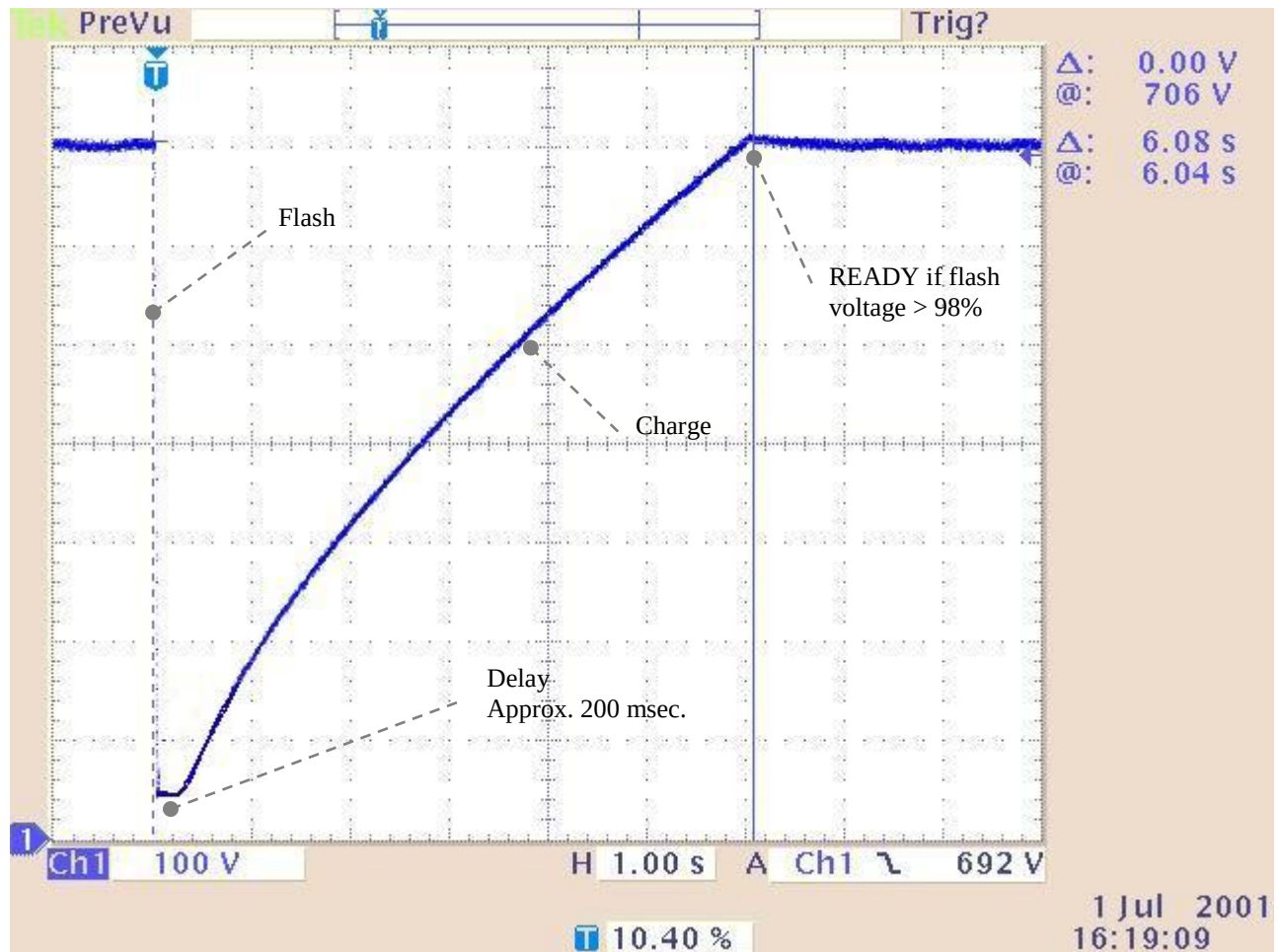
MOSFET charge circuitry

ATTENTION:

Measurement GND (-) is **HIGH VOLTAGE**

Flash voltage HTD (Flash board)

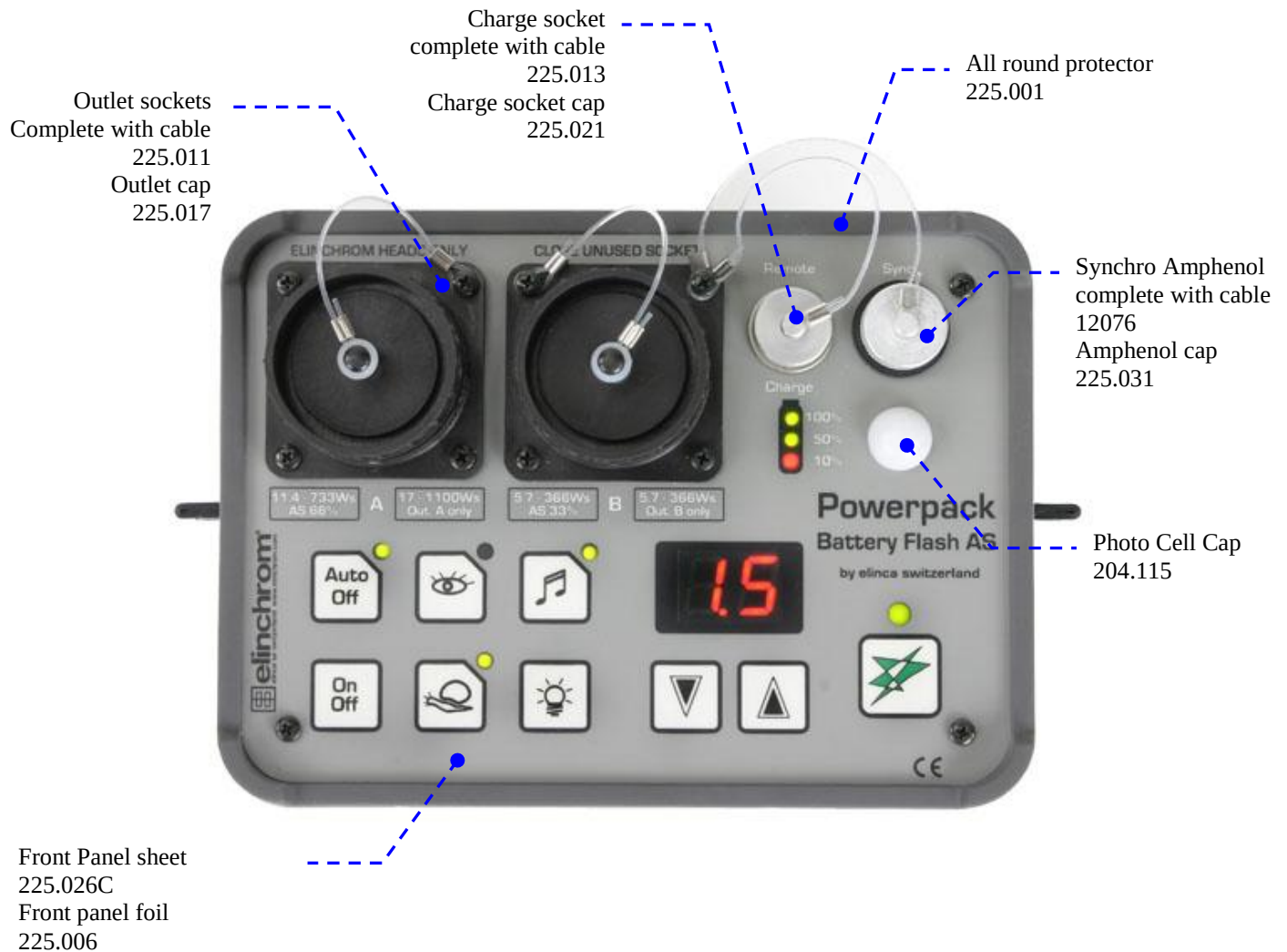
The Style RX series has a absolute stabile flash voltage and f-stop stability. The READY signal is generated only if the flash voltage is greater than 98% of the f-stop setting.



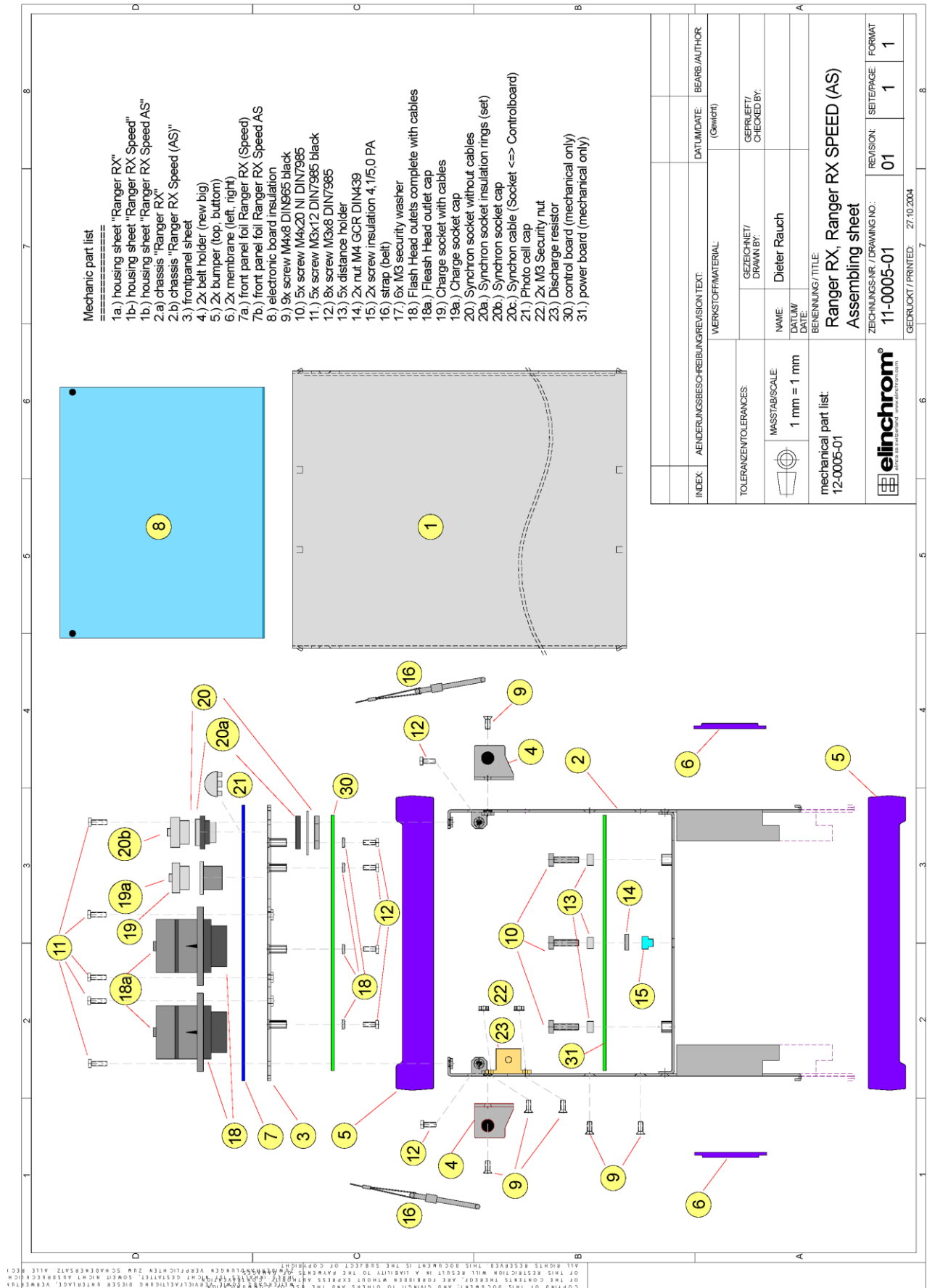
Mechanics

Generator

Front panel view Ranger RX



Explosion drawing

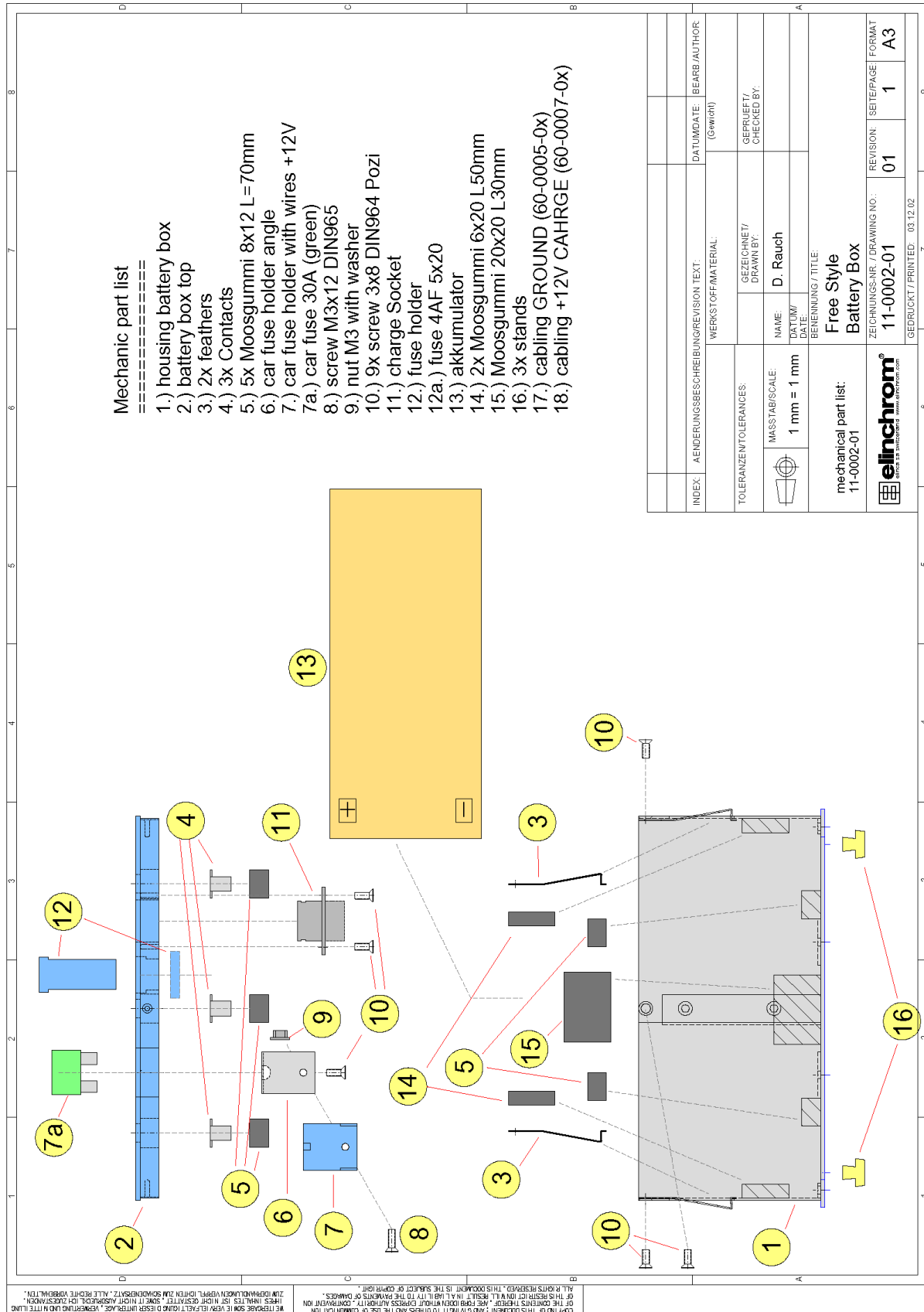


Mechanical part list

Pos.	Description	Used	Elinchrom Part Number
1a	housing sheet "Ranger RX"	1	225.026B3
1b	housing sheet "Ranger RX Speed"	1	225.205A
1c	housing sheet "Ranger RX Speed AS"	1	225.205B
2a	chassis complete "Ranger RX" => small	1	225.026A
2b	chassis complete "Speed" => large	1	225.200
3	front panel sheet	1	225.026C
4	Belt holder, strap	2	225.216
5	bumper	2	225.001
6	membrane	2	225.002
7	front panel foil "Ranger RX" & "Ranger RX Speed"	1	225.006RX
7	front panel foil	1	225.006RXAS
8	electronic board insulation	1	225.008
9	screw M4x8 DIN965 black	7	211.887
10	screw M4x20 NI DIN7985	5	211.888
11	screw M3x12 DIN7985 black	11	211.886
12	screw M3x8 DIN7985	8	211.203
13	distance holder	5	209.138
14	nut M4 GCR DIN439	2	203.029
15	insulation 4,1/5,0 PA	2	204.142
16	strap (belt)	1	19289
17	M3 security washer	6	210.002
18	Flash Head outlets with cables	2	225.011
18a	Flash Head outlet cap	2	225.017
19	Charge/RX socket with cables	1	225.240
19a	Charge socket cap	1	225.021
20	Synchron socket complete without cables	1	12076
20a	Synchron socket insulation rings (set)	1	14485
20b	Synchron socket cap	1	225.031
20c	Synchron cable (socket <=> Control board)	1	501.055
21	Photo cell cap	1	204.115
22	Security nut	1	203.031
23	Discharge resistor 2k2 / 50W	1	111.525
30	Key board (for all Ranger RX types)	1	14541
31a	Power board "Ranger RX"	1	14543
31b	Power board "Speed" + "Speed AS"	1	14544
32a	Flash- Cap.board "Ranger RX" + "Speed"	1	14547
32b	Flash- Cap.board "Ranger RX Speed AS"	1	14548

Battery Box Ranger RX & Speed (AS)

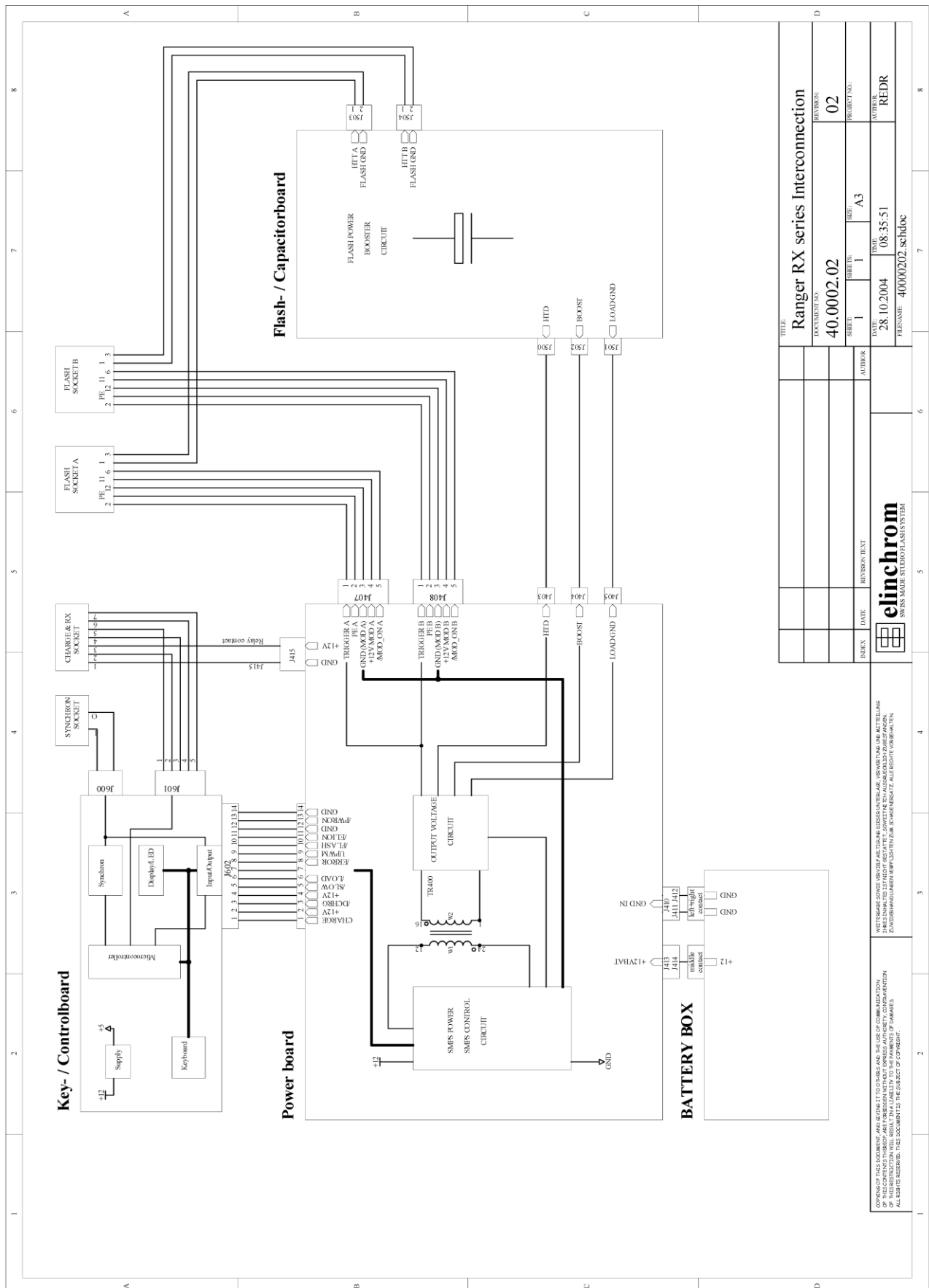
Explosion drawing



Mechanical part list

Pos.	Description	Used	ELINCA_NO
1	Housing battery box Ranger RX	1	225.027
1	Housing battery box Ranger RX Speed (AS)	1	225.215
2	battery box top	1	225.009
3	Feathers	2	225.029
4	Contacts	3	225.030
5	Foam 8x12 L=70mm	0,35 m	225.003
6	car fuse holder angle	1	225.028
7	car fuse holder with wires (+12V)	1	225.015
7a	car fuse 30A (green) for Free Style, Ranger, Ranger RX	1	106.053
7b	car fuse 40A (orange) for Ranger RX Speed (AS) only	1	106.056
8	screw M3x12 DIN965	1	211.602
9	nut m3 with washer	1	203.031
10	screw 3x8 KA30x8	9	211.840
11	charge Socket	1	110.141
12	fuse holder	1	14.651
12a	fuse 4AF 5x20	1	19035.PC
12b	fuse AF 5x20	1	19020.PC
13	Battery 12V-7,2Ah (Ranger RX)	1	225.007
13	Battery 12V-12Ah (Ranger RX Speed/AS)	1	225.225
14	foam 6x20 (2x L50mm)	0,1 m	225.004
15	foam 20x20 L30mm	0,03 m	225.005
16	Stands	4	204.143
17	cabling GROUND	1	225.014
18	cabling +12V CAHRGE	1	225.016
19	cabling	1	225.015

Interconnection diagram



TITLE			
Ranger RX series Interconnection			
DOCUMENT NO.			
40.0002.02			
REVISION			
02			
PROJECT NO.			
A3			
DATE			
28.10.2004			
TIME			
08:35:51			
AUTHOR			
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40000202.schdoc			

WETTERMASS GMBH VERBODT AANTRAAG DOSSER AANLEGEN, REPAREREN EN AFWERKEN
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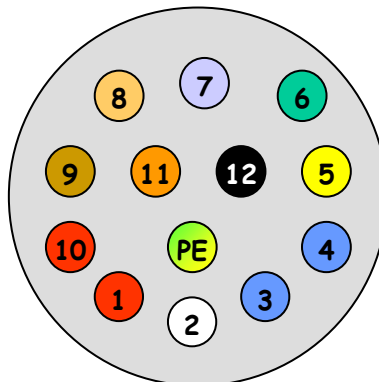
elinchrom
SWISS MADE STUDIOFLASH SYSTEM

Cable Sockets

Round Outlet socket (12 pin + PE)

PE. Ground (=GND)

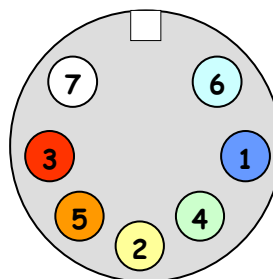
1. + Flash Power pos. pole
2. Trigger
3. – Flash Power neg. pole
4. >do not connect<
5. >do not connect<
6. **Modelling On***
7. >do not connect<
8. >do not connect<
9. >do not connect<
10. >do not connect<
11. + 12VDC switched
12. GND



*push button signal (low impulse will switch on modelling lamp)

Charge & RX-Remote socket (7 pin)

1. GND (Power)
2. A485 (serial com.)
3. + 12VDC (Charge in or supply out)
4. B485 (serial com.)
5. +5VDC (stabilized)
6. GND (Signal)
7. Sync. IN



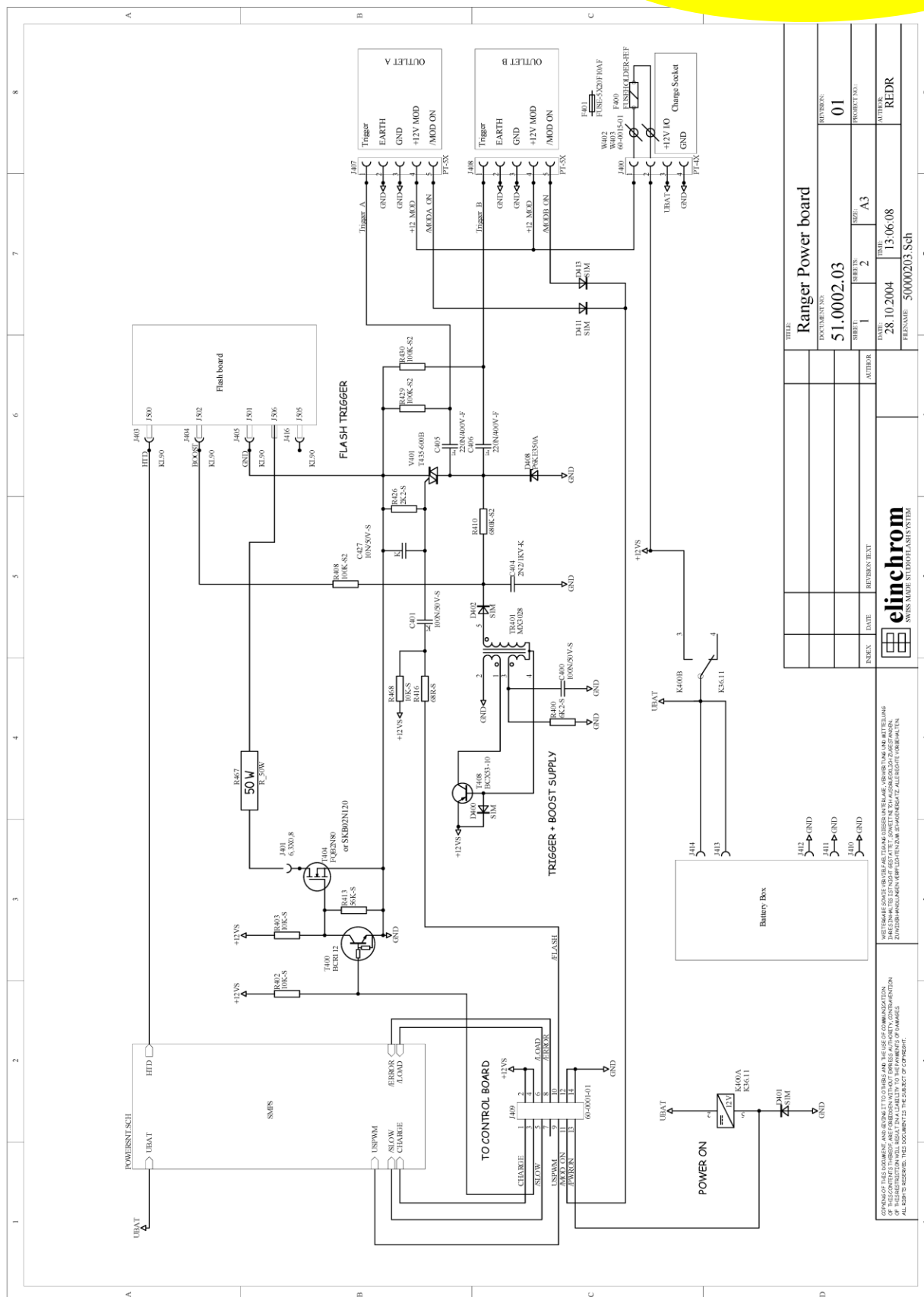
Printed boards

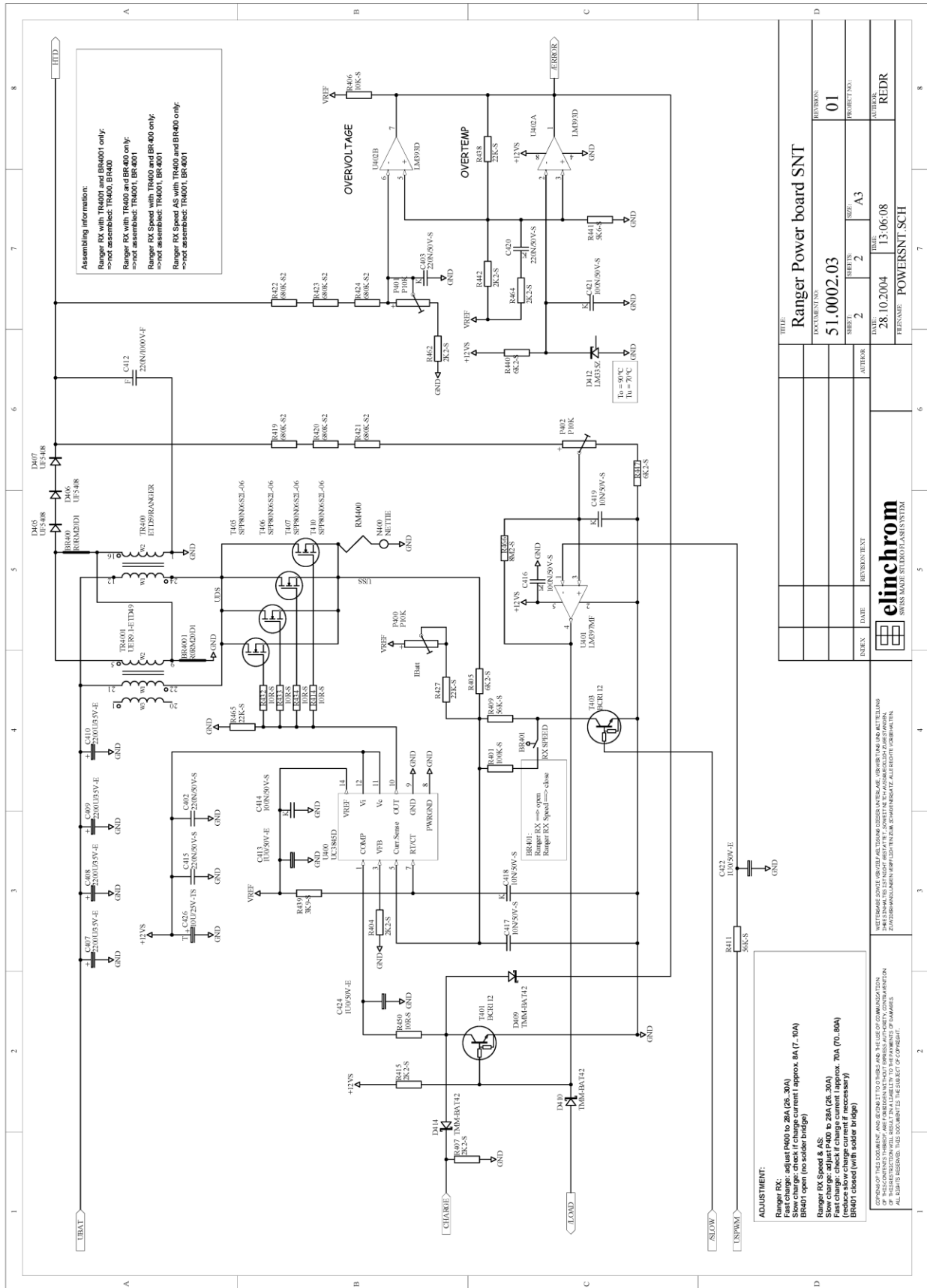
Overview

Board	Description	Ranger RX	Ranger RX Speed	Ranger RX Speed AS
PB1	Flash- & Cap. Board	14547	14547	14548
PB2	Power board	14543	14544	14544
PB3	Key board	14541	14541	14541

Schematics

**Note !
The electronic board is part of
Exchange Service**





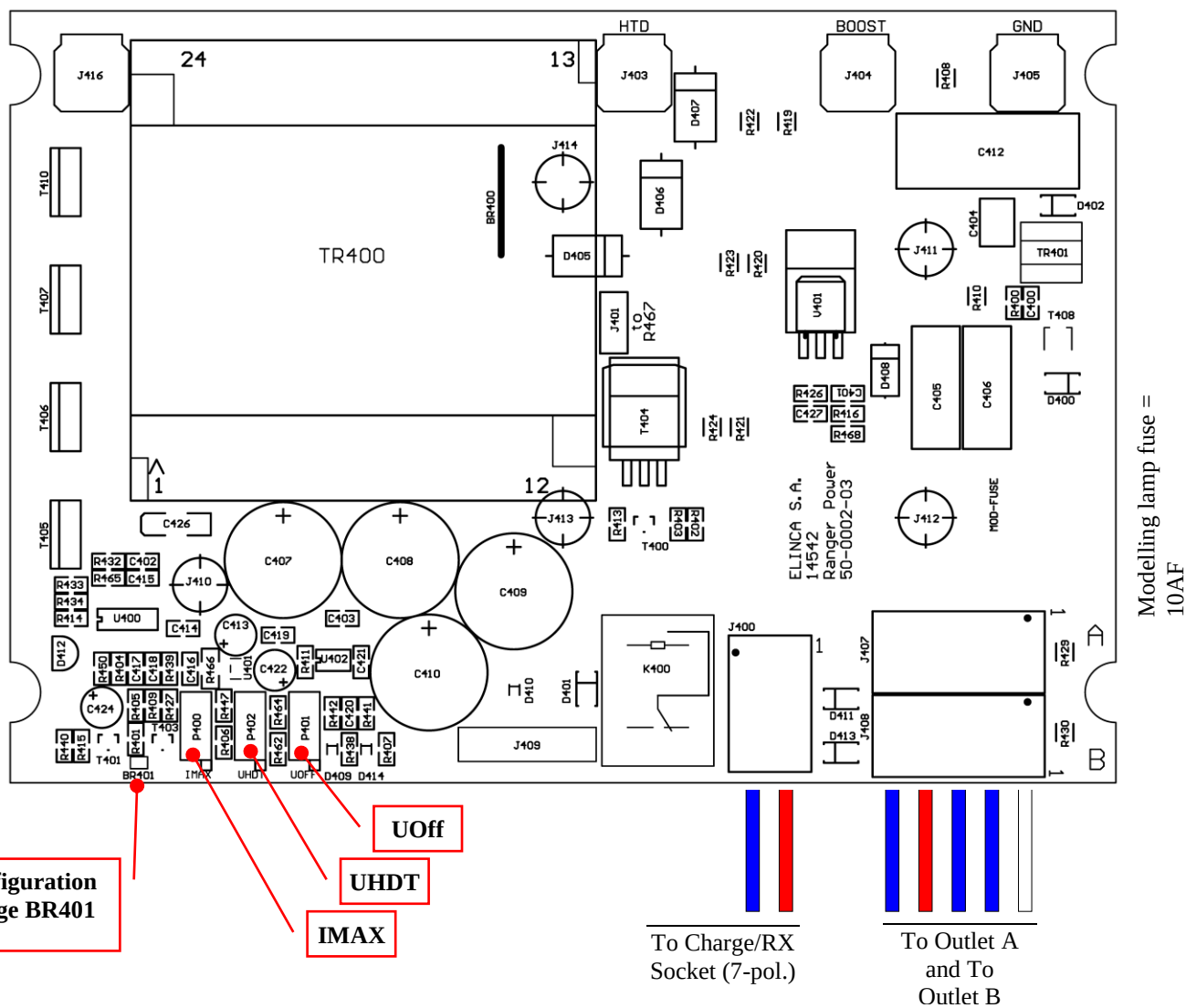
Bill of materials

Pos.	Quantity	DESIGNATOR	PARTTYPE	ELINCA_NO	DESCRIPTION
1	3	C413, C422, C424	1U0/50V-E		ELKO >=35V
2	1	BR400	R0RM20D1		wire bridge d=1mm RM20mm
3	5	C400, C401, C414, C416, C421	100N/50V-S		Capacitor SMD
4	4	C402, C403, C415, C420	220N/50V-S		Capacitor SMD
5	1	C404	2N2/1KV-K		Capacitor Ceramic
6	2	C405, C406	220N/400V-F		Capacitor MKP4
7	4	C407, C408, C409, C410	2200U/35V-E	104.056	ELKO SNT
8	1	C412	220N/1000V-F		Capacitor MKP4
9	4	C417, C418, C419, C427	10N/50V-S		Capacitor SMD
10	1	C426	10U/25V-TS		Capacitor Tantal SMD
11	5	D400, D401, D402, D411, D413	S1M		Diode 1A 1000V SMD
12	3	D405, D406, D407	UF5408		Fast 3A Diode
13	1	D408	P6KE350A		Diode
14	3	D409, D410, D414	TMM-BAT42		Shottky SMD
15	1	D412	LM335Z	105.201	Sensor Temp.
16	1	F400	FUSEHOLDER-FEF		Fuseholder FEF
17	1	F401	FUSE-5X20F10AF		Fuse 5x20 10AF
18	1	J400	PT-4X		Connector 6,3mm
19	1	J401	6,3X0,8	112.078	6,3x0,8 stehend
20	4	J403, J404, J405, J416	KL90		LP-Screw-Connector
21	2	J407, J408	PT-5X		Connector 6,3mm
22	1	J409	60-0001-01		Flat Cable 14P AWG28 200mm
23	1	K400	K36.11		Relais 10A 12V
24	3	P400, P401, P402	P10K		Trimmer
25	4	R400, R405, R440, R447	6K2-S		Resistor 1% SMD
26	1	R401	100K-S		Resistor 1% SMD
27	4	R402, R403, R406, R468	10K-S		Resistor 1% SMD
28	7	R404, R407, R415, R426, R442, R462, R464	2K2-S		Resistor 1% SMD
29	3	R408, R429, R430	100K-S2		Resistor 5% 1W SMD
30	3	R409, R411, R413	56K-S		Resistor 1% SMD
31	7	R410, R419, R420, R421, R422, R423, R424	680K-S2		Resistor 5% 1W SMD
32	5	R414, R432, R433, R434, R450	10R-S		Resistor 1% SMD
33	1	R416	68R-S		Resistor 1% SMD
34	3	R427, R438, R465	22K-S		Resistor 1% SMD
35	1	R439	3K9-S		Resistor 1% SMD
36	1	R441	5K6-S		Resistor 1% SMD
37	1	R466	8M2-S		Resistor 1% SMD
38	3	T400, T401, T403	BCR112		Transistor SMD R1/R2=4k7
39	1	T404	FQB2N80		MOSFET 1200V 2A
40	4	T405, T406, T407, T410	SPP80N06S2L-06		MOSFET
41	1	T408	BCX53-10		SMD PNP Transistor 1A
42	1	TR400	ETD59RANGER		Transformer RX
43	1	TR401	MX3028		Transformer Ue=9V Ua=350V
44	1	U400	UC3845D		SNT-IC SMD
45	1	U401	LM397MF		COMP SMD

46	1	U402	LM393D	COMP SMD
47	1	V401	T435-600B	Triac SMD
48	2	W402, W403	60-0015-01	Cable 1mm2 100mm

Assembly drawing

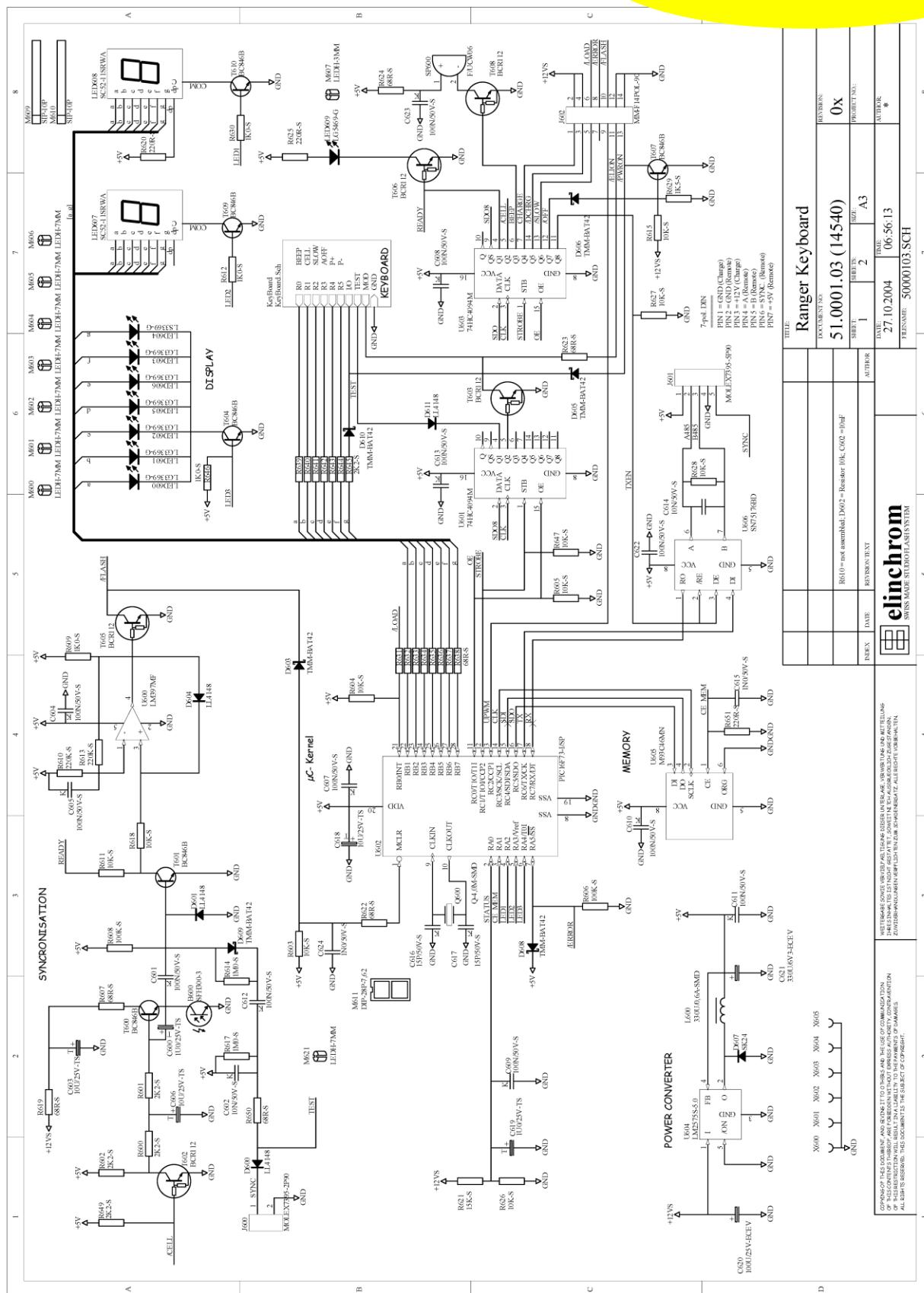
Note !
The electronic board is part of
Exchange Service



Unit	BR401	IMAX @ Slow mode	IMAX @ Fast mode	UHDT	UOff
Ranger RX	Open	8Amps (7..9)	28Amps (26..30)	695V	720V
Ranger RX Speed	Closed	28Amps (26..30)	70Amps (65..80)	695V	720V
Ranger RX Speed AS	Closed	28Amps (26..30)	70Amps (65..80)	695V	720V

Schematics

The electronic board is part of Exchange Service





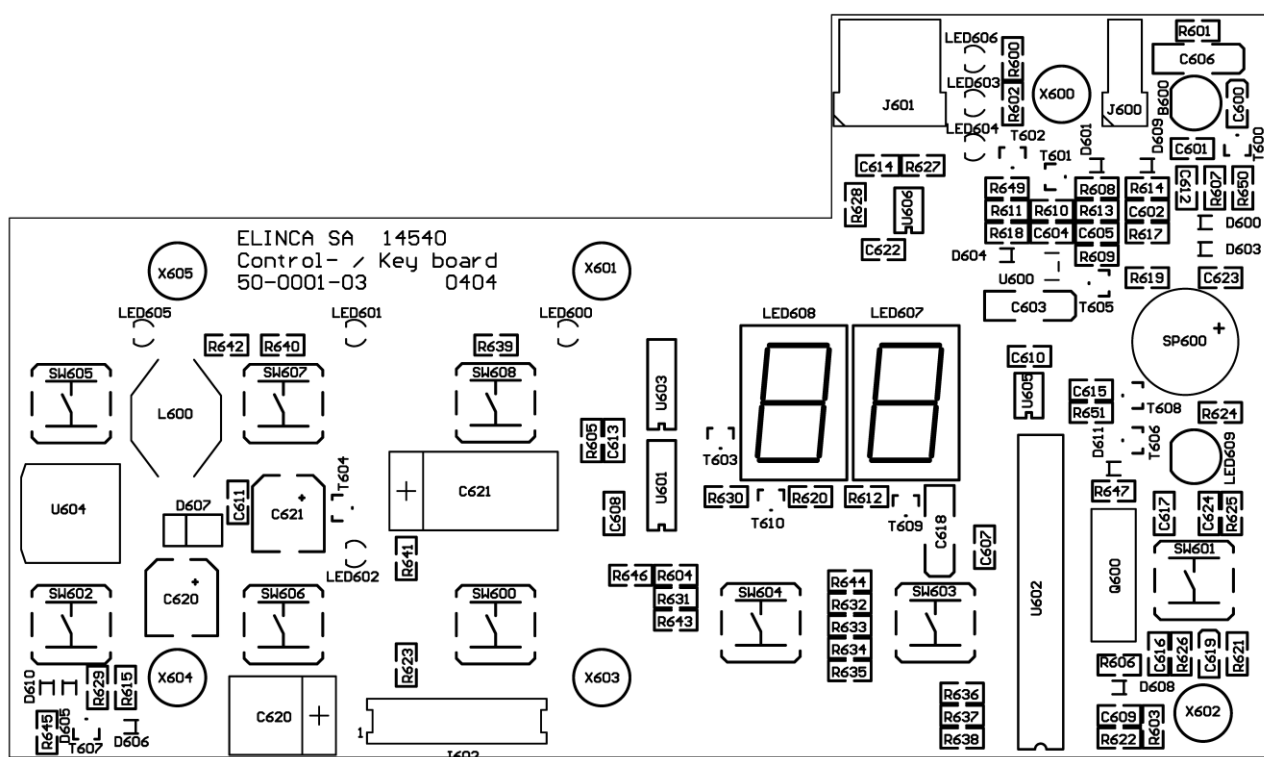
Bill of materials

Pos.	Quantity	DESIGNATOR	PARTTYPE	ELINCA_NO	DESCRIPTION
1	1	B600	SFH300-3		Phototransistor
2	2	C600, C619	1U0/25V-TS		Capacitor Tantal SMD
3	12	C601, C604, C605, C607, C608, C609, C610, C611, C612, C613, C622, C623	100N/50V-S		Capacitor SMD
4	2	C602, C614	10N/50V-S		Capacitor SMD
5	3	C603, C606, C618	10U/25V-TS		Capacitor Tantal SMD
6	2	C615, C624	1N0/50V-S		Capacitor SMD
7	2	C616, C617	15P/50V-S		Capacitor SMD
8	1	C620	100U/25V-ECEV		ELKO SMD 8x6,2mm
9	1	C621	330U/6V3-ECEV		ELKO SMD 8x6,3mm
10	4	D600, D601, D604, D611	LL4148		Diode SMD
11	6	D603, D605, D606, D608, D609, D610	TMM-BAT42		Shottky SMD
12	1	D607	SK24		Shottky 2A 40V
13	1	J600	MOLEX7395-2P90		Connector 2P LP 90°
14	1	J601	MOLEX7395-5P90		Connector 5P LP 90°
15	1	J602	MM-F14POL-90		Mico Match Federleite 14POL 90°
16	1	L600	330U/0,6A-SMD		Inductor
17	6	LED600, LED601, LED602, LED603, LED605, LED606	LG3369-G	108.031	3mm LED
18	1	LED604	LS3369-G		3mm LED red
19	2	LED607, LED608	SC52-11SRWA		LED 7SEG red
20	1	LED609	LG5469-G		5mm LED
21	8	M600, M601, M602, M603, M604, M605, M606, M621	LEDH-7MM	108.030	LED distance holder h=7mm
22	1	M607	LEDH-3MM		LED distance holder h=3mm
23	2	M609, M610	SIP-10P		Single Inline Socket 10P
24	1	M611	DIP-28P-7,62		Dual Inline Socket 28P 7,62mm
25	8	M612, M613, M614, M615, M616, M617, M618, M619	CAP-RAFI-11,5X12,5		Push button cap 11,5mm
26	1	M620	CAP-RAFI-19X12,5		Push button cap 19mm
27	1	Q600	Q-4,0M-SMD		Quarz SMD
28	11	R600, R601, R602, R639, R640, R641, R642, R643, R644, R645, R649	2K2-S		Resistor 1% SMD
29	10	R603, R604, R605, R611, R615, R618, R626, R627, R628, R647	10K-S		Resistor 1% SMD
30	2	R606, R608	100K-S		Resistor 1% SMD
31	14	R607, R619, R622, R623, R624, R631, R632, R633, R634, R635, R636, R637, R638, R650	68R-S		Resistor 1% SMD
32	4	R609, R612, R630, R646	1K0-S		Resistor 1% SMD
33	2	R610, R613	220K-S		Resistor 1% SMD
34	2	R614, R617	1M0-S		Resistor 1% SMD
35	3	R620, R625, R651	220R-S		Resistor 1% SMD
36	1	R621	15K-S		Resistor 1% SMD

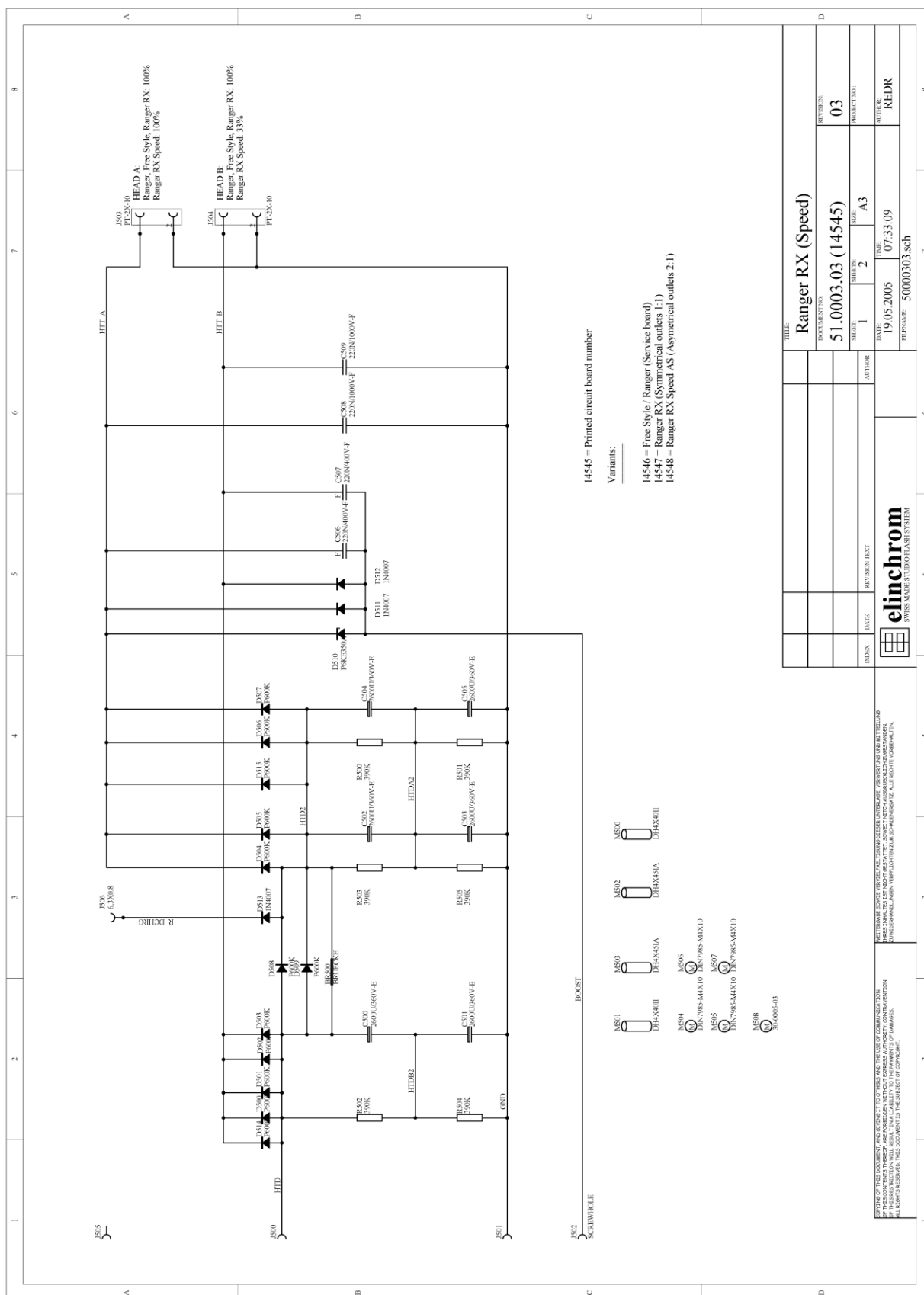
37	1	R629	1K5-S		Resistor 1% SMD
38	1	SP600	F/UCW06	107.025	Buzzer 5V with electronic
39	9	SW600, SW601, SW602, SW603, SW604, SW605, SW606, SW607, SW608	RACON-8H-S		Push button SMD
40	6	T600, T601, T604, T607, T609, T610	BC846B		Transistor SMD
41	5	T602, T603, T605, T606, T608	BCR112		Transistor SMD R1/R2=4k7
42	1	U600	LM397MF		COMP SMD
43	2	U601, U603	74HC4094M		Seriell-parallel converter SMD
44	1	U602	PIC16F73-I/SP	105.145	uC Microchip Flash 28 pol. Out +/-200mA
45	1	U604	LM2575S-5.0		DC-Converter SMD
46	1	U605	M93C46MN		EEPROM SMD 1MBit
47	1	U606	SN75176BD		RS485 Bus driver SMD

Assembly drawing

Note !
The electronic board is part of
Exchange Service



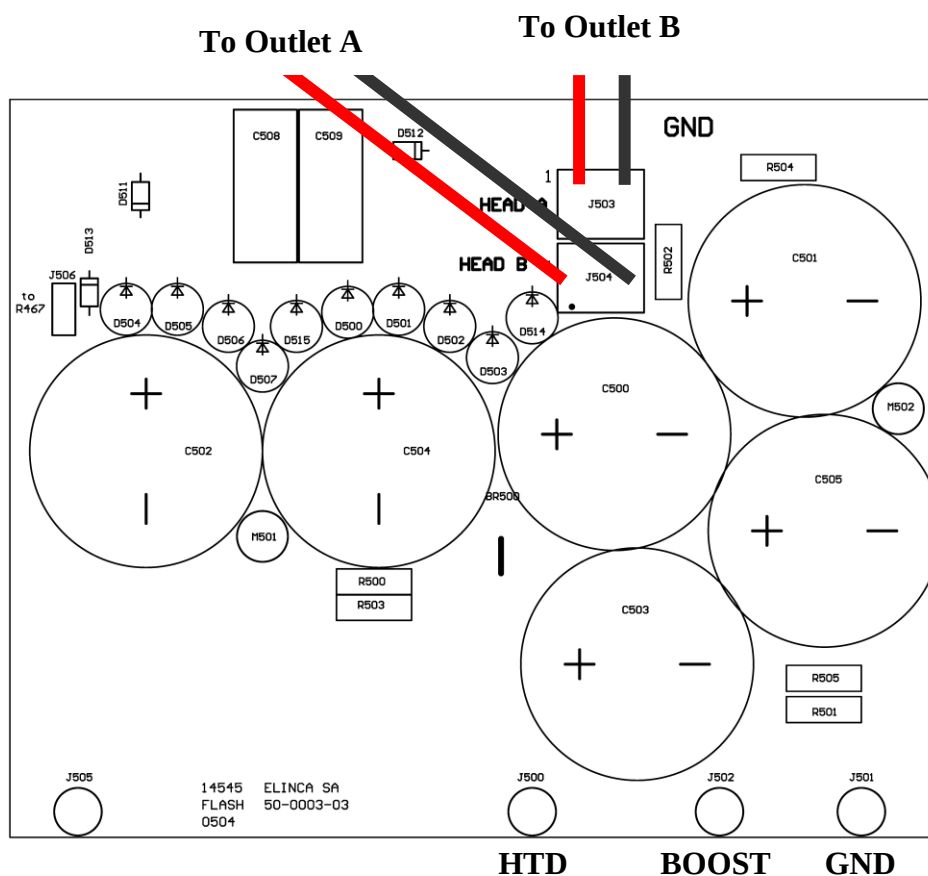
Schematics



Bill of materials Ranger RX and Ranger RX Speed

Pos.	Quantity	DESIGNATOR	PARTTYPE	ELINCA_NO	DESCRIPTION
1	1	BR500	BRUECKE		Wire bridge d=1mm RM10mm
2	6	C500, C501, C502, C503, C504, C505	2600U/360V-E	14342	FLASH Capacitor
3	2	C508, C509	220N/1000V-F		Capacitor MKP4
4	10	D500, D501, D502, D503, D504, D505, D506, D507, D514, D515	P600K	105.050EDI	Diode
5	3	D511, D512, D513	1N4007	14009	Diode
6	2	J503, J504	PT-2X-10		Connector 6,3mm
7	1	J506	6,3X0,8	112.078	6,3x0,8 stehend
8	2	M500, M501	DH4X40II	209.136	Distance holder 4x 40mm II
9	2	M502, M503	DH4X45IA	209.137	Distance holder 4x45mm IA
10	4	M504, M505, M506, M507	DIN7985-M4X10		SCREW DIN7985 M4x10
11	1	M508	30-0005-03		Pertinax sheet 1,5mm
12	6	R500, R501, R502, R503, R504, R505	390K	121.394	Resistor 1%

Assembly drawing Ranger RX and Ranger RX Speed



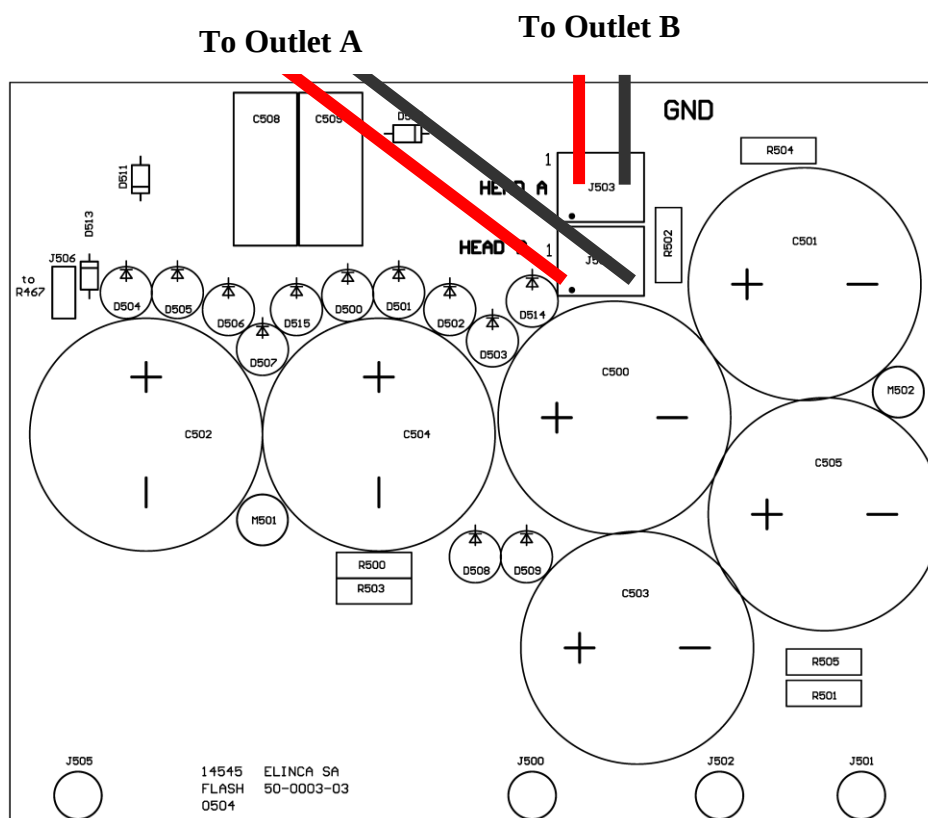
Ranger RX (Speed) / Ranger / Free Style
Flash board 50000303.PcbDoc
.Plot_File_Name Top Assembly Drawing
28.05.2004 SCALE: 1.31 REDR 14.04.04

FR4 2x70um

Bill of materials Ranger RX Speed AS

Pos.	Quantity	DESIGNATOR	PARTTYPE	ELINCA_NO	DESCRIPTION
1	6	C500, C501, C502, C503, C504, C505	2600U/360V-E	14342	FLASH Capacitor
2	2	C508, C509	220N/1000V-F		Capacitor MKP4
3	12	D500, D501, D502, D503, D504, D505, D506, D507, D508, D509, D514, D515	P600K	105.050EDI	Diode
4	3	D511, D512, D513	1N4007	14009	Diode
5	2	J503, J504	PT-2X-10		Connector 6,3mm
6	1	J506	6,3X0,8	112.078	6,3x0,8 stehend
7	2	M500, M501	DH4X40II	209.136	Distance holder 4x 40mm II
8	2	M502, M503	DH4X45IA	209.137	Distance holder 4x45mm IA
9	4	M504, M505, M506, M507	DIN7985-M4X10		SCREW DIN7985 M4x10
10	1	M508	30-0005-03		Pertinax sheet 1,5mm
11	6	R500, R501, R502, R503, R504, R505	390K	121.394	Resistor 1%

Assembly drawing Ranger RX Speed AS



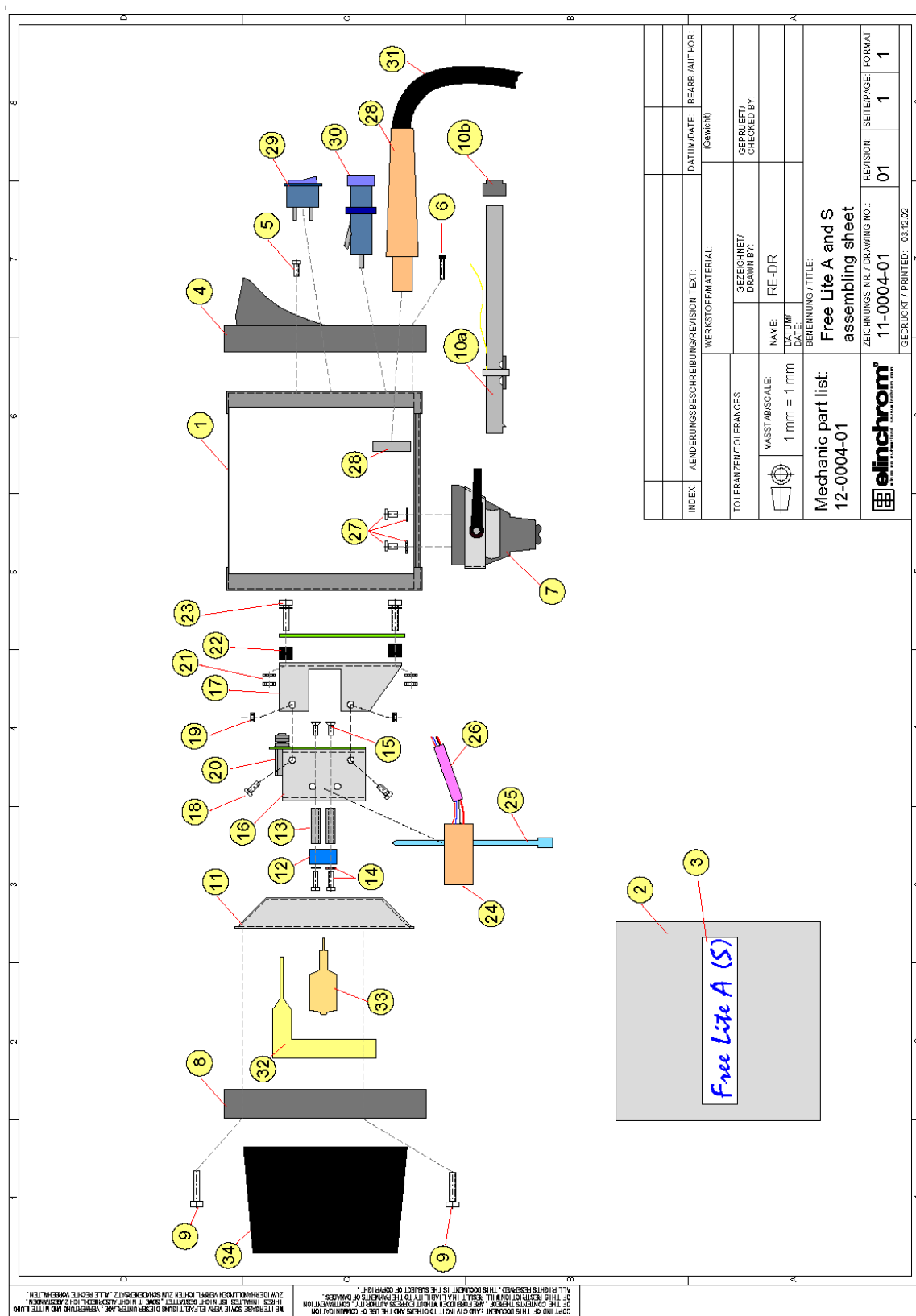
Ranger RX (Speed) / Ranger / Free Style
Flash board 50000303.PcbDoc
.Plot_File_Name Top Assembly Drawing
28.05.2004 SCALE: 1.31 REDR 14.04.04

HTD BOOST GND

Free Lite S and A head

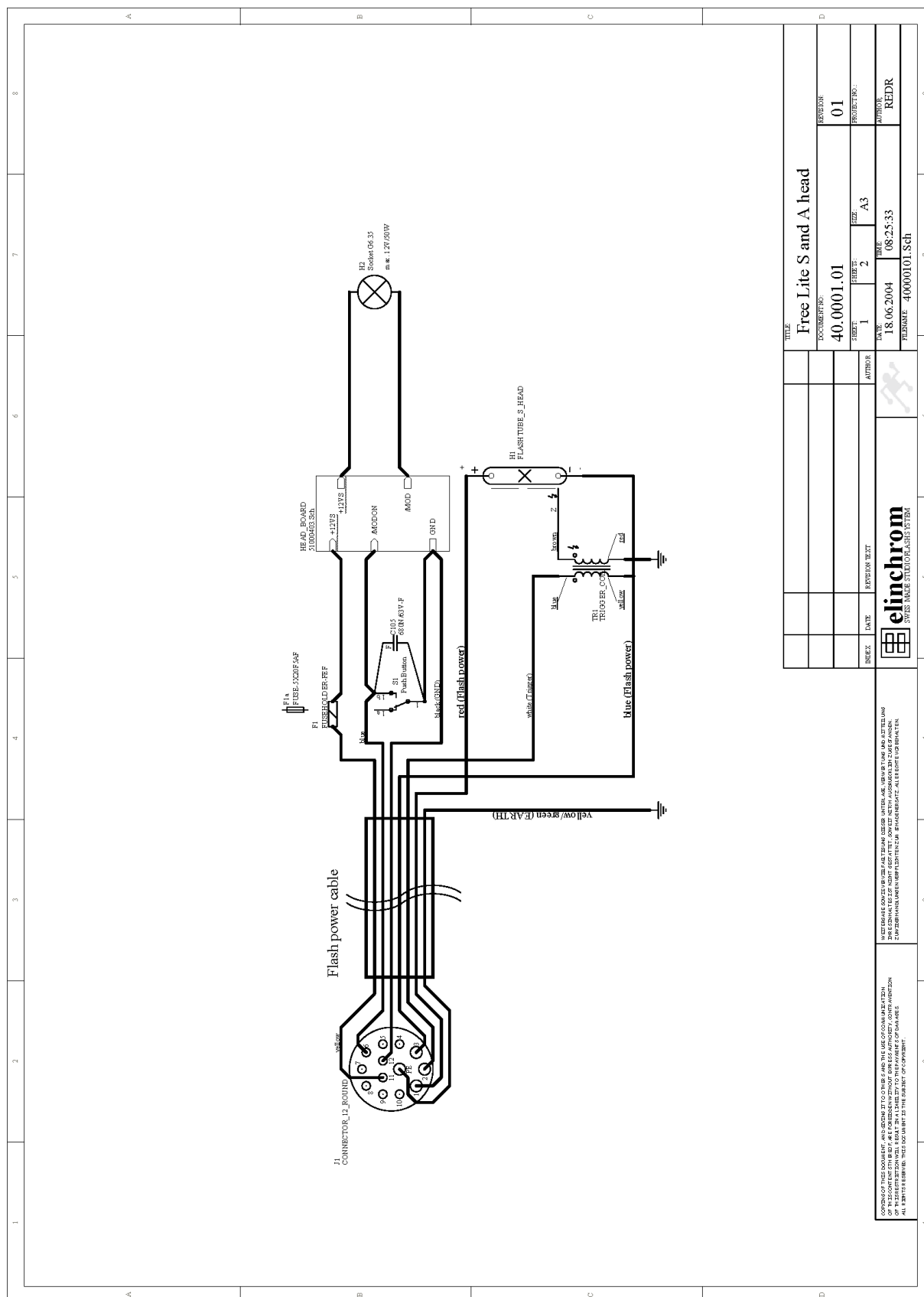
Mechanics

Explosion drawing

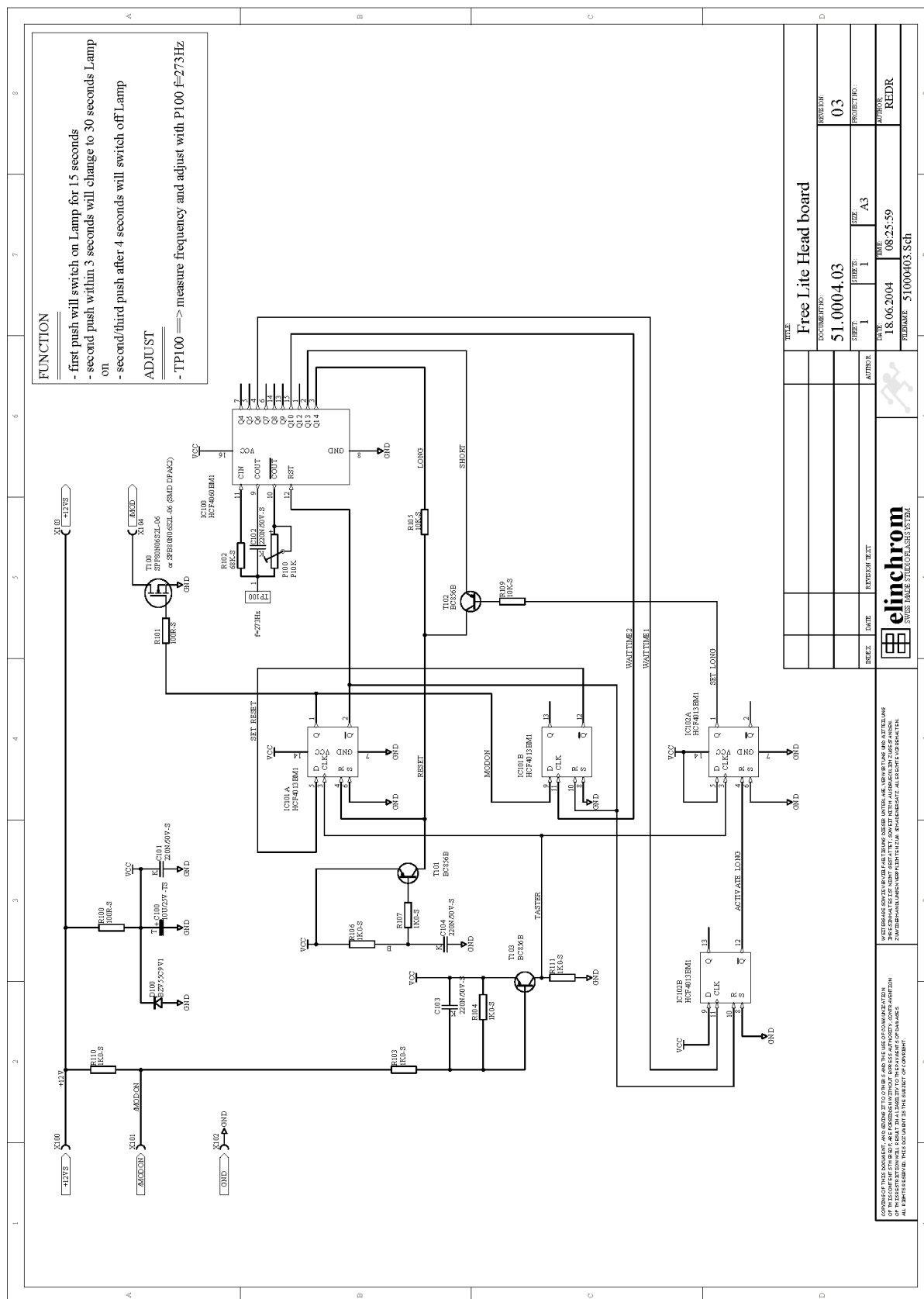


Mechanical Part List

Pos.	Description	Used	ELINCA_NO
1	Metal chassis	1	223.001
2	Housing without label for Free Lite A and S	1	223.002
3a	Label Free Lite S	1	205.237
3b	Label Free Lite A	1	205.238
4	Rear handle	1	22056
5	screw M3x8 mm for handle	2	211.601
6	screw M3x12 mm for handle	1	211.602
7	Tilthead	1	901.201
7a	Fix part	1	201.661
7b	Mobile part	1	201.656
7c	Plastic level	1	14492
7d	Bolt M8 for handle	1	209.093
7e	Locking universal metal plate for umbrella	1	201.295
8	Set front ring + locking device	1	22055
8a	Front locking	1	22054
8b	Front ring bayonet	1	204.090
8c	locking spring	1	212.203
9	Screw for front ring M3x20 mm	3	211.207
10a	Umbrella tube	1	223.004
10b	Ring for umbrella tube	1	14594
11a	Inner Reflector Free Lite A	1	201.081
11b	Inner Reflector Free Lite S	1	201.080
12	Lamp holder G6,35	1	201.500
13	distance holder M3x30	2	209.135
14a	screw M3x12 mm	2	211.106
14b	Isolation washer M3	2	210.116
15	Screw M3x8	2	211.203
16	Light contact plate complete	2	223.003
17	electronic board holder (Fan holder)	1	223.008
18	Screw M3x8 mm	2	211.203
19	Nut with washer M3	2	203.031
20	Set terminal for flash tube (510.020)	1	510.020SAV
20+	terminal for flash tube (Set of 6 units)		14209
21	Nut M4 with washer	2	203.032
22	Isolation distance holder M4x10	2	209.103
23a	Screw M4x10	2	211.212
23b	Washer M4	2	210.003
24a	Trigger coil	1	25001
24b	2m Trigger wire diam. 0,4 (101.124)	1	14214
25	Strip holder	1	101.081
25	Nylon attachment for coil	1	101.077
27	Screw M4x10	4	211.212
28	Protective cable entry	1	101.083
29a	Modelling lamp switch	1	103.085
29b	Capacitor 330nF/63V ????	2	104.064
30a	Fuse holder	1	14651
30b	Fuse 5AF for modelling lamp 50W (set of 10)	1	19036
31a	Flash cable for Free Lite with connector 3m	1	501.011
31b	Extension cable 4m	1	11096
32a	Flash tube A head	1	24053
32b	Flash tube S head	1	24034
33	modelling lamp 12V/50W	1	23044
34	Protective hood	1	26124



Schematic (225.034)

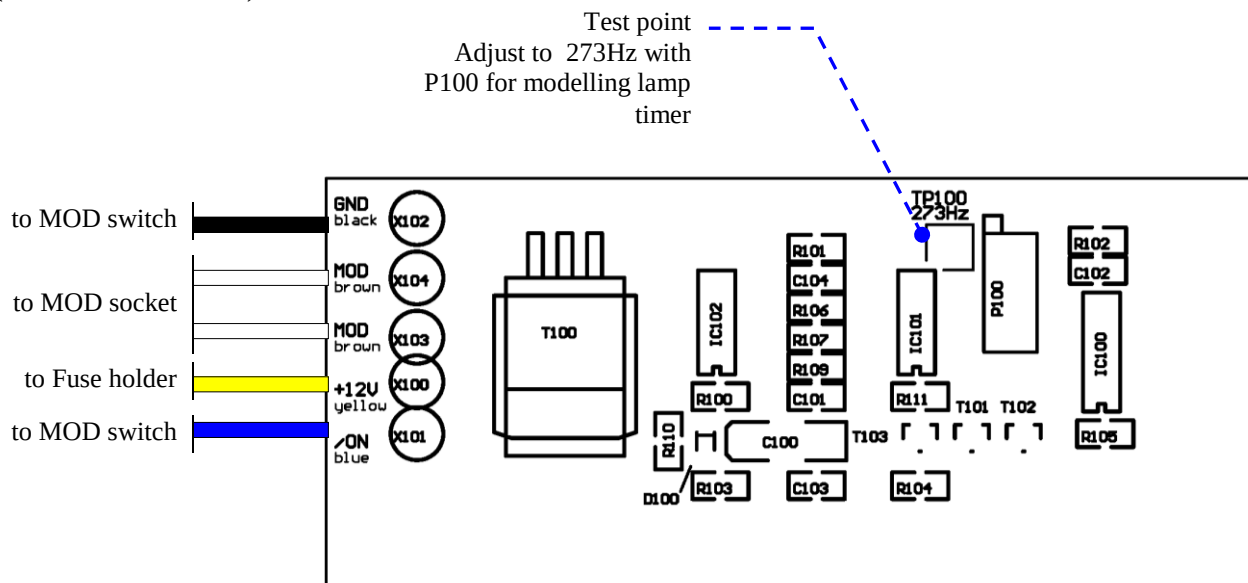


Bill of materials (225.034)

Pos.	Quantity	DESIGNATOR	PARTTYPE	ELINCA_NO	DESCRIPTION
1	1	C100	10U/25V-TS		Capacitor Tantal SMD
2	4	C101, C102, C103, C104	220N/50V-S		Capacitor SMD
3	1	D100	BZV55C9V1		Diode Zehner
4	1	IC100	HCF4060BM1		COUNTER SMD
5	2	IC101, IC102	HCF4013BM1		4x LATCH SMD
6	1	P100	P10K		Trimmer
7	2	R100, R101	100R-S		Resistor 1% SMD
8	1	R102	68K-S		Resistor 1% SMD
9	5	R103, R104, R106, R107, R111	1K0-S		Resistor 1% SMD
10	2	R105, R109	10K-S		Resistor 1% SMD
11	1	R110	1K0	121.102	Resistor 1%
12	1	T100	SPP80N06S2L-06		MOSFET
13	3	T101, T102, T103	BC856B		Transistor SMD

Assembly drawing (225.034)

(head board 50.0005.03)

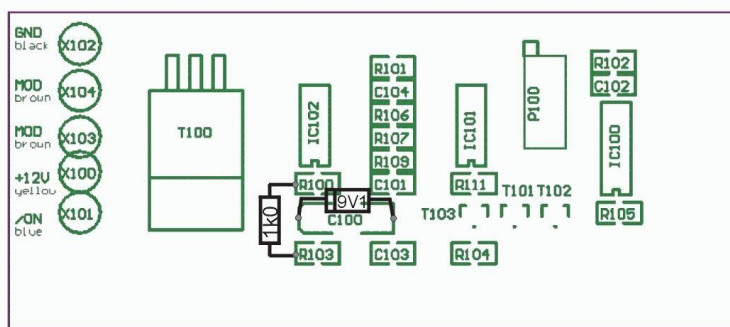


Modifications Free Lite Head board 50.0005.02

board 50.0005.02 only

Fault: Modelling lamp automatically switched on after flash

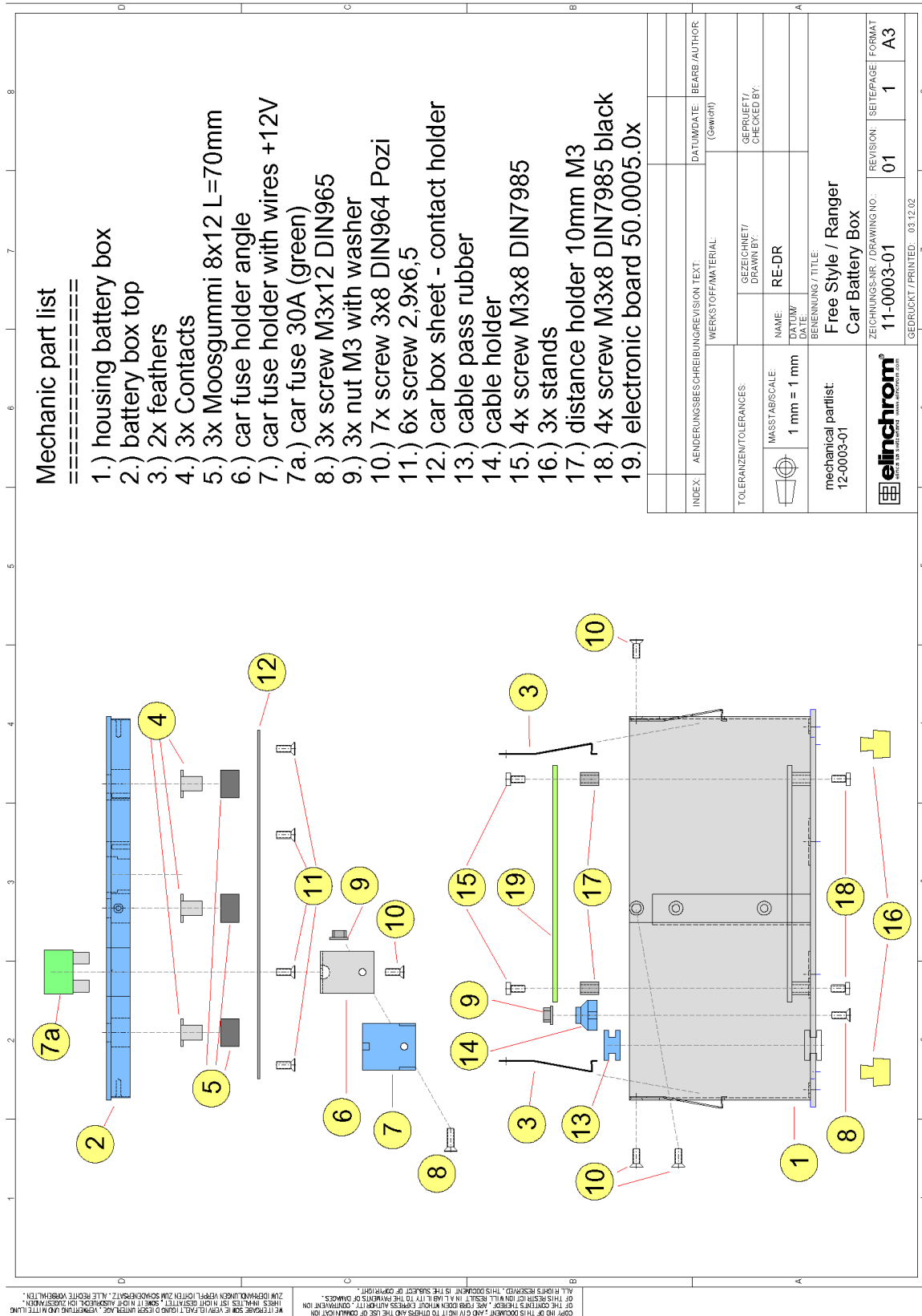
Solution: Add an 1k0 resistor and a 9V1 Z-diode shown in the assembling drawing!



Car Box for Ranger RX only

Mechanic

Explosion drawing

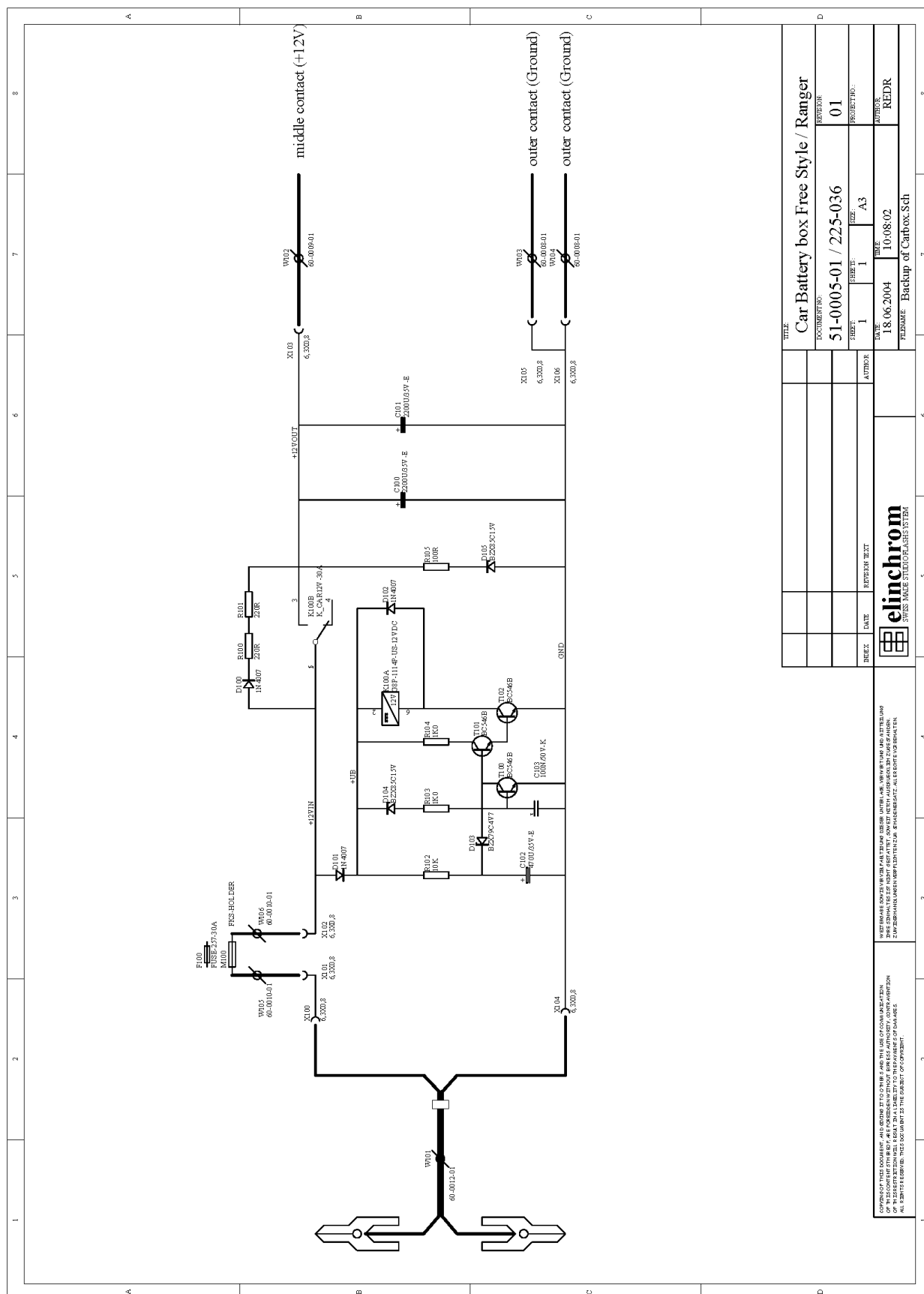


Mechanical Part list

Pos.	Description	Used	ELINCA_NO
1a	Housing battery box for Ranger RX only	1	225.027
2	battery box top	1	225.009
3	feathers	2	225.029
4	Contacts	3	225.030
5	foam 8x12 (3x L=70mm)	0,21 m	225.003
6	car fuse holder angle	1	225.028
7	car fuse holder with wires (2x 60-0010-01)	1	225.053(1x) 101.131 (2x) 110.033 (2x)
7a	car fuse 30A (green) for Ranger RX only	1	106.053
8	screw M3x12 DIN965	3	211.602
9	nut M3 with washer	3	203.031
10	screw 3x8 KA30x8	7	211.840
11	screw 2,9x6,5	6	211.835
12	car box sheet - contact holder (20-0013-01)	1	
13	cable pass (rubber)	1	101.165
14	cable holder	1	101.074
15	screw M3x8 DIN7985	4	211.855
16	stands	4	204.144
17	distance holder 10mm M3	4	209.095
18	screw M3x8 DIN7985 black	4	211.882
19	electronic board 50.0005.0x	1	660.010
20	cabling 60-0008-01	2	101.162 (1x) 110.033 (2x)
21	cabling 60-0009-01	1	101.131 (1x) 110.033 (2x)
22	cabling 60-0012-01	1	225.051

Electronic (225.036)

Car box board (225.036)

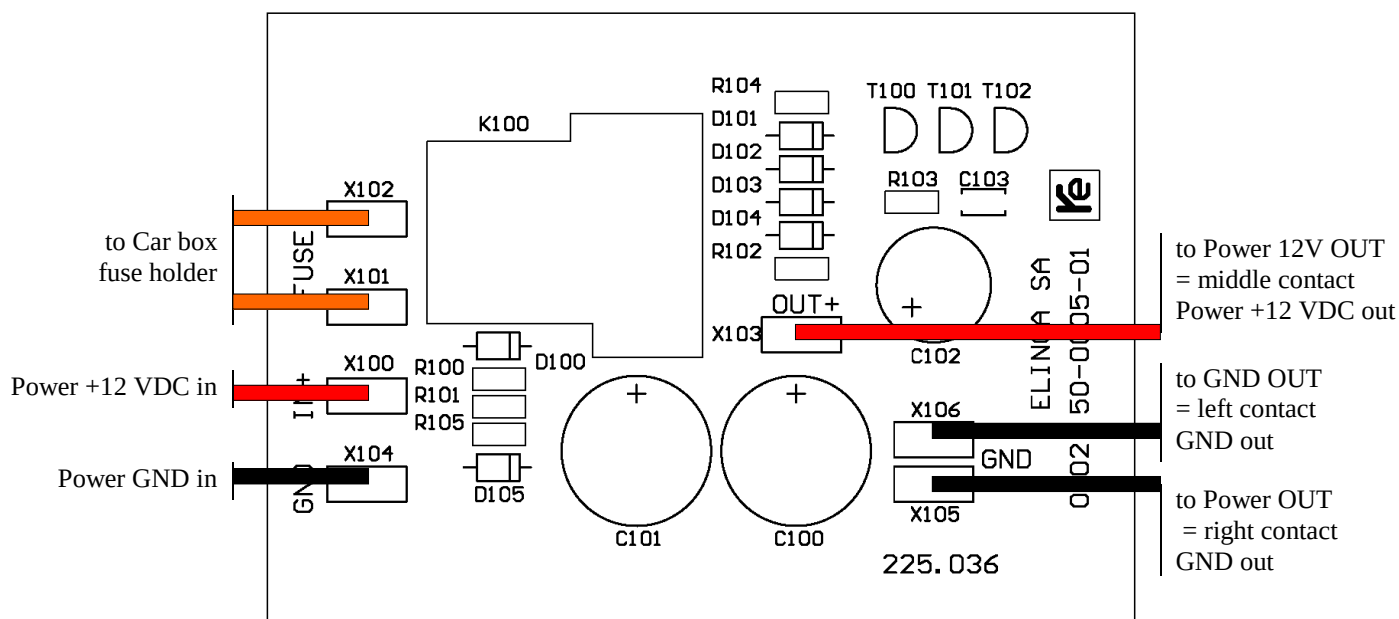


Note: for Free Style, Ranger and Ranger RX only (not for Ranger RX Speed versions)

Bill of Materials (225.036)

Pos.	Quantity	DESIGNATOR	PARTTYPE	ELINCA_NO	DESCRIPTION
1	2	C100, C101	2200U/35V-E	104.056	ELKO SNT
2	1	C102	470U/35V-E	104.055	ELKO
3	1	C103	100N/50V-K	104.015	Capacitor Keramik B37987-F5
4	3	D100, D101, D102	1N4007	14009	Diode
5	1	D103	BZX79C4V7	105.117	Diode Zehner
6	2	D104, D105	BZX85C15V	105.163	Diode Zehner
7	1	F100	FUSE-257-30A	106.053	Car Fuse 30A green
8	1	K100	G8P-1114P-US-12VDC	225.052	Relais 12V 30A
9	1	M100	FKS-HOLDER	225.053	Fuse Holder FKS car fuse
10	2	R100, R101	220R	121.221	Resistor 1%
11	1	R102	10K	121.103	Resistor 1%
12	2	R103, R104	1K0	121.102	Resistor 1%
13	1	R105	100R	121.101	Resistor 1%
14	3	T100, T101, T102	BC546B		Transistor
15	1	W101	60-0012-01	225.051	2x2,5mm2 Car battery connector 3,5m
16	1	W102	60-0009-01		2,5mm2 black L=150 E1:6,3mm E2:6,3mm
17	2	W103, W104	60-0008-01		2,5mm2 black L=150 E1:6,3mm E2:6,3mm
18	2	W105, W106	60-0010-01		2,5mm2 black L=150 E1:6,3mm E2:soldered
19	7	X100, X101, X102, X103, X104, X105, X106	6,3X0,8	112.078	6,3x0,8 male

Assembling drawing (225.036)



This image shows a full page of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting or typing. There are no margins, text, or other markings on the page.